RUTH WADDELL SMITH
School of Criminal Justice, 560 Baker Hall
Michigan State University, East Lansing, MI 48824
Telephone: (517) 353-5283, Fax: (517) 432-1787 e-mail: rwsmith@msu.edu

Education

1999-2003	University of Strathclyde, Glasgow, Scotland. Ph.D. Forensic and Analytical Chemistry Dissertation: Organic and Trace Metal Impurity Profiling in Illicit Ecstasy Seizures with the Application of Chemometric Procedures
1994-1999	University of Strathclyde, Glasgow, Scotland B.Sc. (1st class Hons) Forensic and Analytical Chemistry

Professional Experience

Assistant Professor Forensic Chemistry, MS Forensic Science Program, Michigan State University, MI August 2005-present.
Postdoctoral Research Assistant, Los Alamos National Laboratory, NM, March 2003-June 2005.
Research Assistant, University of Strathclyde, Scotland, November 2002-March 2003.

Research Interests

Applications of new and emerging analytical techniques to the forensic sciences; development of multivariate statistical procedures for classification of forensic evidence.

Current Research

1. Investigating the association and discrimination of ignitable liquids using gas chromatography-mass spectrometry (GC-MS) and multivariate statistical procedures.
2. Developing mass spectrometry methods for the characterization of plants of forensic interest, using multivariate statistical procedures for association and discrimination.
3. Optimizing extraction procedures for the extraction of organic impurities from seized ecstasy tablets.
4. Investigating the persistence of gunshot residue in decomposing tissue samples using scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS) and inductively coupled plasma-mass spectrometry (ICP-MS).
5. Developing methods for the association and discrimination of recycled document papers based on trace element profiles, using ICP-MS and multivariate statistical procedures.

Graduate Committees Chaired

1. Tiffany P. Van De Mark. Influence of Evaporation and Matrix Interferences on the Association and Discrimination of Ignitable Liquids using Chemometric Procedures. Masters, August 2010.
2. Ruth N. Udey. Differentiation of Bullet Type Based on Analysis of Gunshot Residue using Inductively Coupled Plasma Mass Spectrometry. Masters, May 2010.
3. Melissa A. Bodnar. Forensic Analysis of *Salvia divinorum* and Related *Salvia* Species using Chemometric Procedures. Masters, March 2010.
4. Patricia J. Joiner. Optimization of a Microwave-Assisted Extraction Procedure for the Extraction of Organic Impurities from Seized MDMA Tablets. Masters, August 2009.
5. Sarah C. Meisinger. Comparison of Extraction Procedures for the Extraction of Organic Impurities from Seized MDMA Tablets. Masters, August 2009.
6. Jamie M. Baerncopf. Association and Discrimination of Ignitable Liquids from Matrix Interferences using Chemometric Procedures. Masters, June 2009.
7. Lisa M. LaGoo. Persistence of GSR in Decomposing Tissue and Blowfly Larvae. Masters, May 2008.
8. Lucas J. Marshall. Association and Discrimination of Diesel Fuels using Chemometric Procedures for Forensic Arson Investigations. Masters, May 2008.
9. Jennifer M. Froelich. Development of a Small-Scale Single-Tube Proteomics Approach for the Analysis of Protein Biomarkers from Biological Threat Agents. Masters, April 2008.
10. Melissa S. Meaney. Separation and Quantitation of Nitrated Explosives using Thin-Layer Chromatography and Charge-Coupled Device Camera Imaging. Masters, October 2007.
11. Gwynyth Scherperel. Electrospray Ionization Mass Spectrometry for the Detection and Characterization of Smokeless Powders. Masters, August 2007.
12. Carl I.D. Newman. Microchip Separations of Alkaloids with UV-Absorbance Spectral Detection. Masters, July 2007.
13. Heather M. Dotzauer. Optimization of Headspace-Solid Phase Microextraction for the Extraction of Organic Impurities in Seized Ecstasy Tablets. Masters, June 200.
14. Srividhya Kidambi. Analysis of Amphetamine and Methamphetamine by Surface-Enhanced Infrared Spectroscopy. Masters, May 2007.
15. Luther S. Schaeffer. The Persistence of Gunshot Residue on Decomposing Tissue. Masters, May 2007.
16. Agnieszka N. Steiner. Performance of the Reflected Ultraviolet Imaging System (RUVIS) in Visualizing Latent Fingerprints on Various Nonporous and Semiporous Surfaces. Masters, May 2007.
17. Elizabeth A. McGaw. Determination of Trace Elemental Concentrations in Document Papers for Forensic Comparison using Inductively Coupled Plasma-Mass Spectrometry. Masters, April 2007.
18. Kelly M. Greenough. Forensic Analysis of Cosmetic Face Powders. Masters, April 2007.
19. Audrey N. Martin. The Application of Single Particle Aerosol Mass Spectrometry for the Detection and Identification of High Explosives and Chemical Warfare Agents. Masters, November 2006.

20. Chadwick L. Douglass. Artificial Aging and the Effect on Adhesives and Backings of Office and Packaging Tapes. Masters, July 2006.
21. Ellyn L. Schuette. Enhanced Latent Fingerprint Detection in Missing and Exploited Children Investigations. Masters, August 2005.

Undergraduate Research Directed

1. Dahlia I. Campbell. Identification and Correlation of Potential Chemical Fingerprints in Diesel using Gas Chromatography and Mass Spectrometry. McNair/SROP Scholars Program, co-supervised with Dr Victoria L. McGuffin. Summer 2006.
2. Emily Riddell. Effect of Pulsed Pressure Injection on the Analysis of Gasoline using Gas Chromatography-Mass Spectrometry and Chemometric Procedures. Summer 2009-Summer 2010.
3. Johanna Smeekins. Optimization of Pulsed Pressure Injection Procedures for the Analysis of Ignitable Liquids using Gas Chromatography-Mass Spectrometry. Summer 2010-present.

Courses Taught (Michigan State University)

Graduate Level:

CJ805	Survey in Forensic Science (team-taught); Fall 2005-present
CJ819	Forensic Analysis of Drugs and Alcohol; Fall 2005-present
CJ820	Forensic Chemistry and Trace Evidence; Spring 2006-present
FRS809	Issues in Forensic Science; Spring 2008-present
CJ809	Understanding Controlled Substances Analysis (on-line, section 735); Spring 2010
CJ809	Understanding Trace Evidence Analysis (on-line, section 737); Spring 2010

Undergraduate Level:

CJ210	Introduction to Forensic Science (team-taught); Fall 2006

Professional Development

Polarized Light and Chemical Microscopy. Instructed by McCrone College of Microscopy, Westmont, IL. July 10-14, 2006.

Advanced Fire Debris Analysis. Instructed by the FBI Laboratory Explosives Unit, Indianapolis, IN. April 15-17, 2008.

Awards and Recognition

Solvay Interox Prize	1999
Royal Society of Chemistry Award	1997
ICI Wilton Research Award	1997
Dr Quentin Moore Award	1996

Carnegie Bursary Award for Research 1996

Professional Affiliations

American Academy of Forensic Sciences 2005-present
American Chemical Society 2003-present
American Society for Mass Spectrometry 2004-present

Professional Service

Reviewer, Forensic Science II. Advanced Investigations (published by Cengage Learning), October 2009-January 2010.
Guest editor, Special Issue on Forensic Analysis, *Analytical and Bioanalytical Chemistry* 2009.
Moderator, 61st Annual Meeting of the American Association of Forensic Sciences, Denver, CO, February 2009.
Chair, American Chemical Society Local Section (Michigan State University), 2009
Member, Editorial Board for *Journal of Forensic Sciences*
Guest reviewer, *Rapid Communications in Mass Spectrometry, Journal of Chromatography A, Spectrochimica Acta Part B*
Member, Forensic Science Program Admissions Committee, School of Criminal Justice, Michigan State University, 2005-present
Member, Academic Policies Committee, School of Criminal Justice, Michigan State University, 2006-present
Symposium organizer, *Highlighting the Diversity of Mass Spectrometry for Forensic Applications* at the 33rd Federation of Analytical Chemistry and Spectroscopy Societies Annual Meeting, Lake Buena Vista, FL. September 2006.

Professional Service to the Public

Organizer, Chemistry Day Forensic Science Demonstration, Lansing, 2005-present
Organizer, Girls Math Science Conference Forensic Science Demonstration, East Lansing, 2005-present
Supervisor, Science Olympiad Forensic Science Section (State Finals), East Lansing, 2005-present

Publications

Book chapters

1. S.A. Smith, R. Waddell Smith, Y. Xia, Z. Ouyang. Introduction to Mass Spectrometry. In: B. Pramanik, M.S. Lee, G. Chen, editors. Characterization of Impurities and Degradants Using Mass Spectrometry. New Jersey: John Wiley and Sons, 2011.

Articles and reviews

1. R.N. Udey; B.C. Hunter; R. Waddell Smith. Differentiation of Bullet Type Based on Analysis of Gunshot Residue Using Inductively Coupled Plasma Mass Spectrometry. *Journal of Forensic Sciences*. Accepted for publication.
2. J.M. Baerncopf; V.L. McGuffin; R. Waddell Smith. Association of Ignitable Liquid Residues to Neat Ignitable Liquids in the Presence of Matrix Interferences using Chemometric Procedures. *Journal of Forensic Sciences* **2010**. In press.
3. L.M. LaGoo; L.S. Schaeffer; David W. Szymanski; R. Waddell Smith. Detection of Gunshot Residue in Blowfly Larvae and Decomposing Porcine Tissue using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). *Journal of Forensic Sciences* **2010**, *55*, 624.
4. J.M. Baerncopf; V.L. McGuffin; R. Waddell Smith. Effect of GC Temperature Program on the Association and Discrimination of Diesel Samples. *Journal of Forensic Sciences* **2010**, *55*, 185.
5. E.A. McGaw; D.W. Szymanski; R. Waddell Smith. Determination of Trace Elemental Concentrations in Document Papers for Forensic Comparison using Inductively Coupled Plasma Mass Spectrometry. *Journal of Forensic Sciences* **2009**, *54*, 1163.
6. E.A. McGaw; D.W. Szymanski; R. Waddell Smith. Characterization of Undigested Particulate Material following Microwave Digestion of Recycled Document Papers. *Journal of Forensic Sciences* **2009**, *54*, 1171.
7. R. Waddell Smith; V.L. McGuffin. The Need for Research in Forensic Science. Editorial for Special Issue on Forensic Analysis. *Analytical and Bioanalytical Chemistry* **2009**, *394*, 1985.
8. L.J. Marshall; J.W. McIlroy; V.L. McGuffin; R. Waddell Smith. Association and Discrimination of Diesel Fuels using Chemoemtric Procedures. *Analytical and Bioanalytical Chemistry* **2009**, *394*, 2049.
9. G.A. Scherperel; G.E. Reid; R. Waddell Smith. Characterization of Smokeless Powders using Nanoelectrospray Ionization Mass Spectrometry (nESI-MS). *Analytical and Bioanalytical Chemistry* **2009**, *394*, 2019.
10. A.M. Hupp; L.J. Marshall; Dahlia I. Campbell; R. Waddell Smith; V.L. McGuffin. Chemometric Analysis of Diesel Fuel for Forensic and Environmental Applications. *Analytica Chimica Acta* **2008**, *606*, 159.
11. R.J.H. Waddell Smith. A Review of Recent Advances in Profiling Illicit MDMA Samples. *Journal of Forensic Sciences* **2007**, *52*, 1297.
12. N. NicDaéid; R.J.H. Waddell. The Analytical and Chemometric Procedures used to Profile Illicit Drug Seizures. *Talanta* **2005**, *67*, 280.
13. D. Fliegel; R. Waddell; V. Majidi; D. Günther; C. Lewis. Quantification of Aromatic and Halogenated Hydrocarbons and Alcohol Mixtures at the Elemental, Structural, and Parent Molecular Ion Level. *Analytical Chemistry* **2005**, *77*, 1847.
14. R. Waddell; C. Lewis; W. Hang; C. Hassell; V. Majidi. Inductively Coupled Plasma Mass Spectrometry for Elemental Speciation: Applications in the New Millennium. *Applied Spectroscopy Reviews* **2005**, *40*, 33.
15. R. Waddell; D.E. Dale; M. Monagle; S.A. Smith. Determination of High Explosives from a PTFE Wipe using Thermal Desorption-Gas Chromatography with Electron-Capture Detection. *Journal of Chromatography A* **2005**, *1062*, 125.

16. A. Nordon; R.J.H. Waddell; L.J. Bellamy; A. Gachagan; D. McNab; D. Littlejohn; G. Hayward. Monitoring of a Heterogeneous Reaction by Acoustic Emission. *Analyst* **2004**, *129*, 463.
17. R.J.H. Waddell; N. NicDaéid; D. Littlejohn. Classification of Ecstasy Tablets using Trace Metal Analysis with the Application of Chemometric Procedures and Artificial Neural Network Algorithms. *Analyst* **2004**, *129*, 235.
18. K.C. Carter; Y.S. Finnon; N. NicDaéid; D. Robson; R. Waddell. The Effect of Nitrostyrene on Cell Proliferation and Macrophage Immune Responses. *Immunopharmacology and Immunotoxicology* **2002**, *24*, 2.
19. R.J.H. Waddell; D. Littlejohn; N. NicDaéid. Preliminary Studies Identifying and Quantifying Trace Metal Impurities in Illicit Ecstasy Tablets using Atomic Spectrometry Techniques. *Problems of Forensic Sciences* **2001**, *47*, 413.

Encyclopedia Articles

1. Ruth Waddell Smith. Gas Chromatography. In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.
2. Ruth Waddell Smith. Mass Spectrometry. In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.
3. Ruth Waddell Smith. Fourier Transform Infrared Spectrophotometer. In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.
4. Ruth Waddell Smith. Gunshot Residue. In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.
5. Ruth Waddell Smith. Glass (including optical properties). In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.
6. Ruth Waddell Smith. Microcrystalline tests. In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.
7. Ruth Waddell Smith. Separation tests. In: Embar-Seddon, A., Pass, A.D., editors. *Forensic Science.* Hackensack, NJ: Salem Press, 2008.

Presentations at Meetings and Conferences

(*Denotes invited presentation; presenter underlined)

1. Ruth Waddell Smith. Trace Evidence. Oral presentation for the Crime Scene Investigation Summer Camp, Gifted and Talented Education, Honors College, Michigan State University, East Lansing, MI. June 2010.*
2. Ruth Waddell Smith. Are University Forensic Science Programs Meeting the Needs of Forensic Science Laboratories. Oral Presentation at the Forensic Science Education Forum, IUPUI, Indianapolis, IN. June 2010.*
3. Emily G. Riddell, John W. McIlroy, Victoria L. McGuffin, and Ruth Waddell Smith. Effect of Pulsed Pressure Injection on the Analysis of Gasoline using Gas Chromatography-Mass Spectrometry and Chemometric Procedures. Poster presentation at the University Undergraduate Research and Arts Forum, Michigan State University, East Lansing, MI. April 2010.

4. Melissa A. Bodnar, Victoria L. McGuffin, and Ruth Waddell Smith. Forensic Analysis of *Salvia divinorum* and Related Salvia Species Using Chemometric Procedures. Oral presentation at the 62nd Annual Meeting of the American Academy of Forensic Sciences, Seattle, WA. February 2010.
5. Ruth N. Udey, Brian C. Hunter, and Ruth Waddell Smith. Differentiation of Bullet Type Based on Analysis of Gunshot Residue Using Inductively Coupled Plasma-Mass Spectrometry. Oral presentation at the 62nd Annual Meeting of the American Academy of Forensic Sciences, Seattle, WA. February 2010.
6. John W. McIlroy and Ruth Waddell Smith. Use of Volatile Organic Compounds and Chemometric Procedures to Determine Postmortem Interval. Poster presentation at the 62nd Annual Meeting of the American Academy of Forensic Sciences, Seattle, WA. February 2010.
7. Emily G. Riddell, John W. McIlroy, Victoria L. McGuffin, and Ruth Waddell Smith. Effect of Pulsed Pressure Injection on the Analysis of Gasoline using Gas Chromatography-Mass Spectrometry and Chemometric Procedures. Poster presentation at the 62nd Annual Meeting of the American Academy of Forensic Sciences, Seattle, WA. February 2010.
8. Tiffany P. Van De Mark, Melissa A. Bodnar, Victoria L. McGuffin, and Ruth Waddell Smith. Effects of Matrix Interferences on the Identification of Mixed Ignitable Liquids in Fire Debris Using Chemometric Procedures. Poster presentation at the 62nd Annual Meeting of the American Academy of Forensic Sciences, Seattle, WA. February 2010.
9. Patricia J. Joiner and Ruth Waddell Smith. Comparison of Extraction Procedures for Organic Impurity Profiling of Seized MDMA. Oral presentation at the Joint Meeting of the Southwestern, Southern, Midwestern, and Mid-Atlantic Associations of Forensic Scientists, Orlando, FL. October 2009.
10. Tiffany P. Van De Mark, Melissa A. Bodnar, Victoria L. McGuffin, and Ruth Waddell Smith. Association of Evaporated Ignitable Liquids to their Neat Counterparts using Pearson Product Moment Correlation Coefficients and Principal Components Analysis. Poster Presentation at the Joint Meeting of the Southwestern, Southern, Midwestern, and Mid-Atlantic Associations of Forensic Scientists, Orlando, FL. October 2009.
11. Ruth Waddell Smith. Chromatography and Mass Spectrometry: Analysis of Controlled Substances and Fire Debris. Guest lecture for LAW 623F Trial Practice Institute: Forensic Science, College of Law, Michigan State University, East Lansing, MI. September 2009.*
12. Ruth Waddell Smith. Chromatography and Mass Spectrometry: Theory and Instrumentation. Guest lecture for LAW 623F Trial Practice Institute: Forensic Science, College of Law, Michigan State University, East Lansing, MI. September 2009.*
13. Ruth Waddell Smith. Forensic Science at Michigan State University. Oral presentation for the Crime Scene Investigation Program, Gifted and Talented Education, Honors College, Michigan State University, East Lansing, MI. June 2009.*

14. Ruth Waddell Smith. Trace Evidence. Oral presentation for the Crime Scene Investigation Program, Gifted and Talented Education, Honors College, Michigan State University, East Lansing, MI. June 2009.*
15. John. W. McIlroy, Jamie M. Baerncopf, Ruth Waddell Smith, A. Daniel Jones, and Victoria L. McGuffin. Association of Evaporated Ignitable Liquids Using Gas Chromatography-Mass Spectrometry and Chemometric Procedures. Oral presentation at the Central Regional Meeting of the American Chemical Society, Cleveland, OH. May 2009.*
16. Patricia J. Joiner and Ruth Waddell Smith. Optimization of a microwave-assisted extraction (MAE) procedure for the extraction of organic impurities from seized MDMA tablets. Oral presentation at the Central Regional Meeting of the American Chemical Society, Cleveland, OH. May 2009.*
17. John W. McIlroy, Lucas J. Marshall, Ruth Waddell Smith, Victoria L. McGuffin. Pretreatment of Gas Chromatography-Mass Spectrometry Data prior to Chemometric Analysis. Poster presentation at the 60th Annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL. March 2009.
18. Melissa A. Bodnar, Ruth Waddell Smith, and Victoria L. McGuffin. Comparison of Gas Chromatography-Mass Spectrometry and Liquid Chromatography-Mass Spectrometry for Discrimination of Salvia Divinorum from Related Salvia Species using Chemometric Procedures. Poster presentation at the 60th Annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL. March 2009.
19. Jamie M. Baerncopf, Victoria L. McGuffin, and Ruth Waddell Smith. Discrimination of Ignitable Liquids from Burned Matrix Interferences using Chemometric Procedures. Oral presentation at the 61st Annual Meeting of the American Academy of Forensic Sciences, Denver, CO. February 2009.
20. Patricia J. Joiner and Ruth Waddell Smith. Optimization of a Microwave-Assisted Extraction/Headspace Solid Phase Microextraction (MAE/HS-SPME) Procedure for Organic Impurity Profiling of Seized MDMA. Poster presentation at the 61st Annual Meeting of the American Academy of Forensic Sciences, Denver, CO. February 2009.
21. Lisa LaGoo, Brian C. Hunter, David W. Szymanski, Ruth Waddell Smith. Chemical Identification of Gunshot Residue in Decomposing Tissue and Blowfly Larvae Samples using ICP-MS. Oral presentation at the Anachem Symposium, Livonia, MI. October 2008.*
22. Jamie M. Baerncopf, Victoria L. McGuffin, and Ruth Waddell Smith. *Effect of GC Temperature Program on the Discrimination of Diesel Samples for Forensic Arson Investigations*. Oral presentation at the Fall Meeting of the Midwestern Association of Forensic Scientists, Des Moines, IA. October 2008.
23. Patricia J. Joiner and Ruth Waddell Smith. *Development of a Microwave-Assisted Extraction/Headspace Solid Phase Microextraction (MAE/HS-SPME) Procedure for Organic Impurity Profiling of Seized MDMA Tablets.* Poster presentation at the Fall Meeting of the Midwestern Association of Forensic Scientists, Des Moines, IA. October 2008.
24. Lisa LaGoo, Brian C. Hunter, David W. Szymanksi, and Ruth Waddell Smith. Detection of Gunshot Residue from Decomposing Tissue Samples and Blowfly

Larvae using ICP-MS. Poster presentation at the 35th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, Reno, NV. September 2008.

25. Ruth Waddell Smith. *Chromatography and Mass Spectrometry-Theory and Instrumentation.* Invited speaker for LAW 623F Trial Practice Institute: Forensic Science. September 2008.*
26. Ruth Waddell Smith. *Chromatography and Mass Spectrometry-Applications in Controlled Substance and Fire Debris Analysis.* Invited speaker for LAW 623F Trial Practice Institute: Forensic Science. September 2008.*
27. Sarah C. Meisinger, Patricia J. Joiner, and Ruth Waddell Smith. *Development of a Microwave-Assisted Extraction Procedure for Organic Impurity Profiling of Seized MDMA Tablets.* Poster presentation at the 236th American Chemical Society National Meeting and Exhibition, Philadelphia, PA. August 2008.
28. Ruth Waddell Smith. Chromatography. Oral presentation at the Forensic Science Educators Conference, Michigan State University, East Lansing, MI. August 2008.*
29. David W. Szymanski and Ruth Waddell Smith. Glass, Paint and Soil Evidence. Oral presentation at the Forensic Science Educators Conference, Michigan State University, East Lansing, MI. August 2008.*
30. Ruth Waddell Smith. Overview of the Forensic Science Program at Michigan State University. Oral presentation for the Crime Scene Investigation Program, Gifted and Talented Education, Honors College, Michigan State University, East Lansing, MI. June 2008.*
31. Lucas J. Marshall, Amber M. Hupp, Ruth Waddell Smith, and Victoria L. McGuffin. *Association and Discrimination of Diesel Fuels using Chemometric Procedures for Fire Debris Analysis in Forensic Arson Investigations.* Oral presentation at the 60th Annual Meeting of the American Academy of Forensic Sciences, Washington D.C. February 2008.
32. Lisa LaGoo, David W. Szymanski, and Ruth Waddell Smith. *Correlation of GSR Persistence in Decomposing Tissue to GSR Persistence in Blowfly Larvae*. Poster presentation at the 60th Annual Meeting of the American Academy of Forensic Sciences, Washington D.C. February 2008.
33. Sarah C. Meisinger and Ruth Waddell Smith. *Comparison of Extraction Procedures for Organic Impurity Profiling of Seized MDMA Tablets*. Poster presentation at the 60th Annual Meeting of the American Academy of Forensic Sciences, Washington D.C. February 2008.
34. Lucas J. Marshall, Amber M. Hupp, Ruth J.H. Waddell, and Victoria L. McGuffin. *Association and Discrimination of Diesel Fuels using Chemometric Procedures for Arson Investigations.* Poster presentation at the Fall Meeting of the Midwestern Association of Forensic Scientists, Traverse City, MI. September 2007.
35. Sarah C. Meisinger and Ruth J.H. Waddell. *Optimization of Headspace-Solid Phase Microextraction (HS-SPME) for Organic Impurity Profiling of Seized MDMA Tablets.* Poster presentation at the Fall Meeting of the Midwestern Association of Forensic Scientists, Traverse City, MI. September 2007.
36. Amber M. Hupp, Dahlia I. Campbell, Lucas J. Marshall, Ruth J.H. Waddell, and Victoria L. McGuffin. *Chemical Fingerprinting of Diesel Fuels using GC-MS and Chemometric Methods for Forensic Analysis.* Oral presentation at the 58th Pittsburgh

Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, IL. March 2007.

37. Agnieszka Steiner and Ruth J.H. Waddell. *Performance of the Reflected Ultraviolet Imaging System (RUVIS) in Visualizing Latent Fingerprints on Various Non-porous and Semi-porous Surfaces.* Poster presentation at the 59th Annual Meeting of the American Academy of Forensic Sciences, San Antonio, TX. February 2007.
38. Luther S. Schaeffer and Ruth J.H. Waddell. *Persistence of Gunshot Residue in Decomposing Tissue.* Poster presentation at the 59th Annual Meeting of the American Academy of Forensic Sciences, San Antonio, TX. February 2007.
39. Heather M. Dotzauer and Ruth J.H. Waddell. *Optimization of Solid-Phase Microextraction-GC-MS for the Extraction of Organic Impurities in Seized MDMA.* Poster presentation at the 59th Annual Meeting of the American Academy of Forensic Sciences, San Antonio, TX. February 2007.
40. Ruth J.H. Waddell, Dahlia I. Campbell, Amber M. Hupp, Victoria L. McGuffin. *Forensic Discrimination of Diesel Samples*. Oral presentation at the 33rd Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, Lake Buena Vista, Florida, September 2006.*
41. Ruth Waddell, Don E. Dale, and Matthew Monagle. *Thermal Desorption of HMX from a PTFE Wipe using Gas Chromatography with Electron-Capture Detection using a Dual Column-Dual Detector Configuration.* Poster presentation at the 229th American Chemical Society Annual Meeting, San Diego, California, March 2005.
42. Ruth Waddell, Cris L. Lewis, and D. Christian Hassell. *Chemical Speciation of Hydrocarbon Mixtures using Gas Chromatography Time-of-Flight Mass Spectrometry with a Pulsed Glow Discharge Ion Source.* Oral presentation at the 30th Annual Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies, Fort Lauderdale, Florida, October 2003.

Grant Activity

Current

Source:	Midwest Forensics Resource Center
Project Title:	Comparison of Gas Chromatography-Mass Spectrometry and Liquid Chromatography-Mass Spectrometry for Discrimination of *Salvia divinorum* from Related Salvia Species using Chemometric Procedures
Principal Investigator:	Ruth Waddell Smith and Victoria L. McGuffin
Award:	$54,886 (52% indirect costs)
Award Period:	12 months (January 2010-December 2010)

Source:	Forensic Sciences Foundation Lucas Grant
Project Title:	Further Investigation of Trace Element Concentrations for Discrimination of Recycled Document Papers
Principal Investigator:	Ruth Waddell Smith
Award:	$1,800
Award Period:	September 2009-September 2010

Source:	American Academy of Forensic Sciences Pathology/Biology Section
Project Title:	Detection of Gunshot Residue from Decomposing Tissue Samples using Inductively Coupled Plasma Mass Spectrometry
Principal Investigator:	Ruth Waddell Smith and Brian C. Hunter
Award:	$2,990
Award Period:	June 2010-December 2010

Source:	Faculty Initiatives Fund, College of Social Science, Michigan State University
Project Title:	Multivariate Statistical Procedures for the Analysis of Questioned Documents: Improving Current Practices
Principal Investigator:	Ruth Waddell Smith
Award:	$6,596
Award Period:	July 2010-June 2011

Previous

Source:	Midwest Forensics Resource Center
Project Title:	Application of Chemometric Procedures to Differentiate Ignitable Liquid Residues from Substrate Interferences for Arson Investigations. Part I-Creating Reference Collections and Optimizing Data Analysis Procedures.
Principal Investigator:	Ruth Waddell Smith and Victoria L. McGuffin
Award:	$54,886 (52% indirect costs)
Award Period:	December 2008-December 2009

Source:	Forensic Sciences Foundation Lucas Grant
Project Title:	Development of Microwave-Assisted Extraction Procedures for Organic Impurity Profiling of Seized 3,4-Methylenedioxymethamphetamine (MDMA)
Principal Investigator:	Ruth Waddell Smith
Award:	$1,250
Award Period:	September 2008-September 2009

Source:	Forensic Sciences Foundation Lucas Grant
Project Title:	Detection of Gunshot Residue from Larvae and Decomposing Tissue Samples using Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)
Principal Investigator:	Ruth J.H. Waddell
Award:	$2,400
Award Period:	September 2007-September 2008

Source:	Midwest Forensics Resource Center
Project Title:	Optimization of Headspace-Solid Phase Microextraction (HS-SPME) for Organic Impurity Profiling of Illicit MDMA Tablets
Principal Investigators:	Ruth J.H. Waddell
Award:	$27,208
Award Period:	February 2007-September 2007