

Speckin Forensic Laboratories

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Speckin Forensic Laboratories

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EDUCATION

Master of Science in Forensic Science, Forensic Chemistry Concentration

Michigan State University

Graduation Date: Fall 2009

Advisor: Dr. Ruth Waddell Smith

Thesis: Comparison of extraction methods for organic impurity profiling of 3,4-methylenedioxymethamphetamine (MDMA)

Relevant Coursework

Forensic Analysis of Drugs and Alcohol

Forensic Chemistry and Microscopic Evidence

Pharmacology of Drug Addiction

Separation Science

Law and Forensic Science

Advanced Analytical Chemistry

Scanning Electron Microscopy

Survey of Forensic Science

Crime Scene Investigation

Forensic Entomology

Bachelor of Science in Chemistry, American Chemical Society Certified, *Cum Laude*

University of Missouri-Columbia

Minor: Biology

Graduation Date: May 2007

Relevant Coursework

Instrumental Chemistry

Analytical Chemistry

Physical Chemistry

Inorganic Chemistry

Organic Chemistry

Physics with Labs

Cellular Biology

Calculus

Bioethics

Biochemistry

PROFESSIONAL EXPERIENCE

Speckin Forensic Laboratories, Okemos, Michigan: August 2009 - present

- Perform document analysis using Video Spectral Comparator (VSC-2000) and Electrostatic Detection Apparatus (ESDA)
- Identify inks found on questioned documents using thin layer chromatography (TLC) and comparisons to an ink library
- Date inks using densitometer and gas chromatography-mass spectrometry (GC-MS)
- Train and assist intern in the examination of questioned documents and the use of instruments used in the examination

INTERNSHIP EXPERIENCE

Speckin Forensic Laboratories, Okemos, Michigan: May 2009 - August 2009

- Worked with forensic chemist in the analysis of questioned documents including microscopic evaluation, ESDA and VSC evaluations
- Assisted in the identification and dating of ink on questioned documents

Michigan State Police, Sterling Heights Laboratory, Michigan; May 2008 - August 2008

- Observed and assisted chemists with analysis of suspected drug cases through microcrystal tests, color tests, microscopic examination, and instrumental analysis, including gas chromatography-mass spectrometry and attenuated total reflectance infrared spectroscopy
- Assisted fire debris analysts in the analysis of fire debris, extracting and analyzing ignitable liquid residues
- Assisted latent print examiners in processing evidence using superglue fuming, powder dusting, ninhydrin, and photography
- Worked with forensic scientist in the analysis of rape kits including the use of indicator tests, microscopes, and staining
- Worked through mock firearms cases involving shell casing comparisons and bullet comparisons using a comparison microscope and handgun analysis

Omaha Police Department Crime Laboratory, Omaha, Nebraska; May - August 2006

- Gained experience in methods of crime scene investigation by assisting technicians in collecting evidence at crime scenes
- Observed processing of evidence in the laboratory including latent print examination

ANALYTICAL TECHNIQUES and INSTRUMENTATION EXPERIENCE

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|---|---|
| Gas chromatography (GC) | Gas chromatography-mass spectrometry (GC-MS) |
| Mass spectrometry (MS) | Fourier-transform infrared spectroscopy (FTIR) |
| Microwave-assisted extraction (MAE) | Headspace-solid phase microextraction (HS-SPME) |
| Microspectrophotometry (MSP) | Ultraviolet-visible light spectroscopy (UV-Vis) |
| Polarized light microscopy (PLM) | Digital and film photography |
| Comparison microscopy | Scanning electron microscopy (SEM) |
| Thin layer chromatography (TLC) | Densitometry |
| Attenuated total reflectance infrared spectroscopy (ATR-FTIR) | |

RESEARCH EXPERIENCE

Speckin Forensic Laboratories

Development of ink dating procedure by gas chromatography-mass spectrometry

- Studied the presence of 2phenoxyethanol in various types and colors of ink
- Developed a one-step and two-step extraction procedure
- Investigated the application of the developed procedure to casework

Michigan State University, Advisor: Dr. Ruth Waddell Smith

Comparison of extraction methods for organic impurity profiling of MDMA

- Developed and optimized procedures for the extraction of organic impurities from MDMA tablets using microwave assisted extraction, headspace solid-phase microextraction, and liquid-liquid extraction.
- Analyzed extracts by gas-chromatography-mass spectrometry
- Evaluated the resulting chromatograms and mass spectra using statistical procedures

Discrimination of Cosmetic Face Powders

- Optimized procedures for analysis of face powders using attenuated total reflectance infrared spectroscopy
- Developed methods for the analysis of cosmetic face powders using a variety of analytical techniques including microspectrophotometry, gas chromatography-flame ionization detection, ultra-violet visible spectroscopy, and infrared spectroscopy

PUBLICATIONS

- Giebink PJ, Waddell Smith R, "Development of Microwave-Assisted Extraction Procedure for Organic Impurity Profiling of Seized 3,4-Methylenedioxymethamphetamine (MDMA)." J Forensic Science; in press.

ORAL PRESENTATIONS

- *The dating of writing inks through 2-phenoxyethanol using gas chromatography-mass spectrometry: advantages, interpretations, and limitations.* Patricia J. Giebink, Jason Harner, Erich J. Speckin. Association of Forensic Document Examiners Continuing Education Symposium. Phoenix, AZ; October 2010.
- *Forensic Document Examination.* Patricia J. Giebink. Kalamazoo Trial Lawyers Association. Kalamazoo, MI; October 2010.
- *Document Examination.* Patricia J. Giebink. CSI Camp-Michigan State University. East Lansing, MI. June 2010.
- *Optimization of a microwave-assisted extraction (MAE) procedure for the extraction of organic impurities from seized MDMA Tablets.* Patricia J. Joiner and Ruth Waddell Smith. Central Regional Meeting of the American Chemical Society. Cleveland, OH. May 2009.

POSTER PRESENTATIONS

- *Optimization of a microwave assisted extraction/headspace solid-phase microextraction (MAE/HS-SPME) procedure for organic impurity profiling of seized 3,4-methylenedioxymethamphetamine (MDMA) tablets.* Patricia J. Joiner and Ruth Waddell Smith. American Academy of Forensic Sciences 61st Annual Scientific Meeting. Denver, CO. February 2009.
- *Development of a microwave-assisted extraction/head-space solid phase microextraction procedure for the organic impurity profiling of seized MDMA tablets.* Patricia J. Joiner and Ruth Waddell Smith. 37th Annual Midwestern Association of Forensic Scientists Fall Meeting. Des Moines, IA. October 2008.
- *Development of a microwave-assisted extraction procedure for organic impurity profiling of seized MDMA tablets.* Sarah C. Meisinger, Patricia J. Joiner, and Ruth Waddell Smith. 236th American Chemical Society National Meeting. Philadelphia, PA. August 2008.
- *Beta-Cyclodextrin alters the secondary-structure of the beta-amyloid peptide.* Patricia J. Joiner, John Simpson, and Renee JiJi. University of Missouri-Columbia, Life Sciences Week 2007 Poster Session.

TEACHING EXPERIENCE

Michigan State University, Teaching Assistant

School of Criminal Justice, January 2009 - Present

Course: Forensic Chemistry and Microscopic Evidence (graduate level)

- Organized laboratory exercises for graduate students
- Assisted students in completing laboratory exercises
- Assessed student's performance through grading lab reports

School of Criminal Justice, August 2008 - December 2008

Course: Introduction to Forensic Science (undergraduate level)

- Lectured on the topic of controlled substances
- Maintained course website by posting files and updating quizzes and grades
- Assisted professor in writing quiz and exam questions
- Answered student questions involving course material and website problems

Department of Chemistry, August 2007 - December 2007

Course: Chemistry Laboratory II (undergraduate level)

- Instructed and supervised laboratory experiments and answered student questions
- Evaluated and provided feed-back on students' performance in lab

University of Missouri-Columbia, Teaching Assistant

Department of Chemistry, August 2006 - December 2006

Course: Atoms and Molecules with Lab (undergraduate general chemistry)

- Explained material and worked sample problems during weekly discussion sections
- Answered student questions in class and in one-on-one settings
- Supervised laboratory experiments and techniques
- Assessed students' performance through grading lab reports, homework, and exams

PROFESSIONAL ORGANIZATIONS

- Trainee Affiliate, American Academy of Forensic Sciences, 2008 - Present
- Student member, American Chemical Society, 2008 - 2010

OUTREACH ACTIVITIES

CSI Camp, June 2010 and June 2011

- Presented information covering questioned documents to high school students
- Organized and led the students in laboratory exercises to reinforce the information given in the lecture

Chemistry Day, October 2008

- Supervised children performing forensic related activities the day of the event
- Explained basic theory behind the activities to the participants

Forensic Science Educator's Conference, Michigan State University, August 2008

- Assisted in the set up of lab activities for high school teachers
- Explained the lab and helped teachers complete the lab

"Crime at the Michigan State University Zoo," Cub Scout Demonstration, March 2008

- Created crime scene scenario for scouts to solve including evidence to analyze
- Organized activities for scouts including fingerprinting, shoeprint casting, and analyzing hair samples
- Explained scenario and supervised and assisted scouts during the event

“**Using TLC to Solve a Crime,**” Girls Math/Science Conference, February 2008

- Organized and prepared thin layer chromatography activity for girls aged 10-12 years
- Explained TLC theory and procedures to girls at the event
- Supervised participants in a laboratory experiment at the event