Dana-Marie K. Dennis

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Education:

University of Central Florida – Orlando, FL August 2010 – August 2015
Doctorate of Philosophy – Chemistry
Emphasis on analytical chemistry and forensic science applications
Committee Chair: Michael E. Sigman, Ph.D.
Dissertation: Chemical analysis, databasing, and statistical analysis of smokeless powders for forensic application

University of Central Florida – Orlando, FL August 2003 – May 2009
Bachelor of Science – Forensic Science
Minors in Chemistry and Criminal Justice

Teaching and Research Experience:

National Center for Forensic Science at the University of Central Florida – Orlando, FL
Postdoctoral Associate October 2015 - Present
Research Project, duties, and responsibilities

Chemical Analysis of Smokeless Reloading Powders for Maintenance of Smokeless Powders Database
Application of Bayesian Networks to Commercial Smokeless Reloading Powder Data for Investigative Source Identification
Interpretation of data from smokeless powders analysis; distillation of research findings to publishable form
Co-authored the smokeless powders final project report for the National Institute of Justice

National Center for Forensic Science at the University of Central Florida – Orlando, FL
Graduate Research Assistant May 2011 – August 2015
Research Project

Chemical Analysis of Smokeless Reloading Powders for Maintenance of Smokeless Powders Database
Statistical Analysis of Smokeless Reloading Powders

Chemistry Department, University of Central Florida – Orlando, FL
Graduate Teaching Assistant

Trace Evidence January 2011 – May 2011

- Assisted students with laboratory preparations, experiments, supervising laboratory work and grading.
- Topics covered included trace analysis of simulated forensic fiber samples, soil, and other trace material typically encountered at crime scenes.
- Instrumentation and experiments included attenuated total reflectance Fourier transform infrared spectrometer (ATR-FTIR), ultraviolet-visible spectrometer (UV-VIS), polarized light microscope (PLM), stereomicroscope, gas chromatograph-mass spectrometer (GC-MS), thin layer chromatography (TLC), and preparation of solutions.

Forensic Microscopy August 2010 – December 2010

- Assisted students with laboratory preparations, experiments, and supervision of laboratory work
- Topics covered included microscopic analysis of natural and synthetic fibers using the polarized light microscope, and conoscopic analysis of forensic samples for determination of the optical indicatrix.
- Assisted students in the preparation of slide projects which included the permanent mounting of fibers and other simulated forensic samples.

National Center for Forensic Science at the University of Central Florida – Orlando, FL

Intern May 2009 – August 2010

Assisted in the development of the internet accessible Smokeless Powders Database hosted at the National Center for Forensic Science (NCFS)

Development of methodologies for the chemical analysis of commercially available smokeless reloading powders for database upload

Co-authored the NCFS smokeless powder database standard operating procedure for sample analysis, analytical data interpretation and preparation

The NCFS Smokeless Powders Database can be found at the Universal Resource Locator http://www.ilrc.ucf.edu/powders/.

Publications:

Dennis, Dana-Marie K.; Williams, Mary R.; Sigman, Michael E. "Assessing the Evidentiary Value of Smokeless Powder Comparisons." Forensic Science International; 2016; 259: 179 – 87.

Additional manuscripts being prepared for publication

Poster Presentations:

The names of the presenting authors are underlined

Dennis, Dana-Marie K.; Williams, Mary R.; Sigman, Michael E. "Investigative Predictions of Smokeless Powder Manufacturers." American Academy of Forensic Sciences 2016. Las Vegas, NV. February 22 – 27, 2016.

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

Dennis, Dana-Marie K.; Frisch, Jessica L.; Williams, Mary R.; Sigman, Michael E. "Smokeless Powders Chemical Analysis and Database Development." Florida Annual Meeting and Exposition 2011. Palm Harbor, FL. May 12 – 14, 2011.

Oral Presentations:

Dennis, Dana-Marie K.; Frisch-Daiello, Jessica L.; Williams, Mary R.; Sigman, Michael E. "Smokeless Powders Database at the National Center for Forensic Science." American Academy of Forensic Sciences 2015. Orlando, FL. February 16 – 21, 2015.

Dennis, Dana-Marie K.; Waddell, Erin E.; Williams, Mary R.; Sigman, Michael E. "Cluster Analysis of Smokeless Powders and Classification by Discriminant Analysis." Florida Annual Meeting and Exposition 2014. Palm Harbor, FL. May 8 – 10, 2014.

Dennis, Dana-Marie K.; Waddell, Erin E.; Williams, Mary R.; Sigman, Michael E. "Cluster Analysis of Smokeless Powders and Classification by Discriminant Analysis." Pittcon Conference and Exposition 2014. Chicago, IL. March 2 – 6, 2014.

Dennis, Dana-Marie K.; Williams, Mary R.; Sigman, Michael E. "Cluster Analysis of Smokeless Reloading Powders using the Total Ion Spectrum." Florida Annual Meeting and Exposition 2013. Palm Harbor, FL. May 9 – 11, 2013.

Dennis, Dana-Marie K.; Williams, Mary R.; Waddell, Erin E.; Sigman, Michael E. "Cluster Analysis of Smokeless Powders using the Total Ion Spectrum." Annual Explosives Committee Meeting for the Scientific Working Group for Fire and Explosions 2012. Orlando, FL. December 11, 2012.

Coursework:

Graduate – University of Central Florida

Applied Analytical Chemistry (CHM 6710) – Concepts in molecular structure that integrate structural, physical, and chemical properties with aspects of industrial and analytical chemistry.

Applied Organic Synthesis (CHM 6251) – A survey of chemical syntheses from both a product-oriented standpoint and a process-oriented standpoint. Relevant examples from the pharmaceutical and agricultural chemical industries.

Chemical Thermodynamics (CHM 6240) – Classical and statistical thermodynamics with emphasis on industrial applications and estimation methods.

Kinetics and Catalysis (CHM 6440) – Classical kinetics with an emphasis on industrial applications and current catalysis methodologies.

Applied Molecular Spectroscopy (CHM 5235) – Determination of chemical structure through interpretation of UV, IR, NMR and Mass Spectra.

Explosives and Accelerants Analysis (CHM 6548) – Forensic analysis of explosives and accelerants by mass spectrometric techniques.

Forensic Analysis Laboratory (CHS 6539C) – Forensic analytical laboratory techniques focusing on spectroscopic and chromatographic methods.

Principles of Forensic Science (CHS 5502) – Principles of forensic science crime scene investigation, concepts in physical and biological evidence, evidence collection and transport, discrimination and individualization of evidence.

Undergraduate – University of Central Florida

Organic Chemistry I
(CHM 2210)

Organic Chemistry II
(CHM 2211)

Organic Laboratory Techniques
(CHM 2211L)

Analytical Chemistry
(CHM 3120)

Analytical Chemistry Techniques
(CHM 3120L)

Introduction to Forensic Science
(CHS 3501)

Forensic Microscopy
(CHS 3505C)

Forensic Biochemistry
(CHS 3533)

Forensic Science in the Courtroom
(CHS 3595)

Forensic Laboratory Quality Assurance
(CHS 4537)

Trace Evidence
(CHS 3511C)

Forensic Analysis of Controlled Substances
(CHS 3530C)

Forensic Investigative Technology
(CHS 4506C)

Forensic Crime Scene Investigation
(CHS 4515C)

***Skills*:**

Instrumentation Proficiencies

- Gas Chromatography-Mass Spectrometry

- Fourier Transform Infrared Spectroscopy
- Scanning Electron Microscopy/Energy Dispersive X-ray Spectroscopy

Computer Software and Programming Proficiencies

- Microsoft Office Suite
- MATLAB
- Sigma Plot
- R for statistical computing
- MSD ChemStation

Certificates:

Certificate of Achievement July 2011
Chemistry Graduate Teaching Assistance Certificate Program
University of Central Florida

***References*:**

Furnished upon request