

MADELEINE J. SWORTWOOD, PH.D.

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EDUCATION

Ph.D. in Chemistry

2013

Florida International University, Miami, FL

Specialty Track: Forensic Science

Dissertation: “Comprehensive Forensic Toxicological Analysis of Designer Drugs”

B.A. in Biochemistry

2009

Duquesne University, Pittsburgh, PA

Minor: Biology

Magna Cum Laude

RESEARCH EXPERIENCE AND EMPLOYMENT

Assistant Professor

2016 – present

Forensic Science Department, College of Criminal Justice, Sam Houston State University, Huntsville, TX

- Research focus on novel psychoactive substances in alternative matrices
- Instructor for graduate level classroom and laboratory instruction, including Forensic Instrumental Analysis, Forensic Toxicology, and Advanced Instrumental Analysis
- Instructor for undergraduate level online course instruction, including Forensic Science and Ethics & Professional Practice
- Oversee Masters and Doctoral level research projects with graduate students

Postdoctoral Fellow

2014 – 2016

Clinical Pharmacology and Therapeutics Branch, National Institute on Drug Abuse, Intramural Research Program, National Institutes of Health, Baltimore, MD

- Develop and validate LC-MS/MS method for detecting buprenorphine and naloxone (and their respective metabolites, including glucuronides) in plasma and breast milk for investigating neonatal outcomes following opioid-addiction treatment during pregnancy and breastfeeding
- Pharmacokinetic analysis and interpretation of cannabinoids in oral fluid by LC-MS/MS following controlled cannabis administration
- Associate investigator in controlled cannabis administration clinical trial which includes: study design and implementation, preparation of regulatory documents, obtaining informed consent of research subjects, analysis and interpretation of pharmacokinetic and pharmacodynamic data
- Experienced in administering partial Drug Recognition Expert examinations to research subjects following controlled cannabis administration

- Metabolite identification of synthetic cathinones, involving human liver microsomes, human hepatocyte incubations, LC-HRMS method development, and metabolite identification data-mining software
- Examining *in utero* drug and alcohol exposure in umbilical cord, placenta, fetal liver, and meconium by LC-MS/MS
- Extensive instrument experience with SCIEX 5500 QTrap, SCIEX 6500, Shimadzu 8050, and Thermo Scientific QExactive Orbitrap; Software experience with GraphPad Prism, IBM-SPSS, Analyst, MultiQuant, Inquisit, Compound Discoverer, MetaSite and WebMetabase, and TraceFinder

Toxicologist I**2012 – 2013***Miami-Dade County Medical Examiner, Toxicology Laboratory, Miami, FL*

- Performed routine post-mortem drug analyses from sample acquisition to screening, confirmation, and quantification of drugs, volatiles, and poisons using EMIT, ELISA, color spot tests, GC and LC-MS techniques
- Participated in regular proficiency testing, including blood alcohol
- Assisted in preparing laboratory and SOPs for ABFT laboratory accreditation
- Extensive instrument experience with Agilent GC-ECD, -FID, -NPD, and -MS, Varian LC-QQQ-MS, Bruker Amazon LC-MS; Software experience with ChemStation and in-house LIMS

Intern**2011 – 2012***Miami-Dade County Medical Examiner, Toxicology Laboratory, Miami, FL*

- Developed and validated methods for detecting and quantifying pharmaceuticals, drugs of abuse, and novel psychoactive substances, including transitioning methods and SOPs from LLE to SPE and from GC-MS to LC-MS/MS techniques
- Update GC-MS spectral libraries for improved detection of novel psychoactive substances

Graduate Researcher**2009 – 2013***DeCaprio Group, Toxicology Laboratory, Florida International University, Miami, FL*

- Examined cross-reactivity of designer drugs in commercial immunoassays (ELISA and EMIT) via NIH-funded grant
- Developed and validated LC-MS/MS methods for identification and quantification of designer drugs in serum
- Executed frequent LC-MS troubleshooting and instrument maintenance, including Agilent 6460 and Varian 500; Software experience with MassHunter

Intern**2008 – 2009***Food and Drug Administration, Forensic Chemistry Center, Cincinnati, OH*

- Developed libraries for a handheld Raman system for identification of counterfeit pharmaceuticals
- Researched drug diversion by detection of adhesive removers by FTIR, Raman, and GC-MS

PUBLICATIONS

Swortwood MJ, Bartock SH, Scheidweiler KB, Shaw S, Filis P, Douglas A, O'Shaughnessy PJ, Soffientini U, Lucendo-Villarin B, Iredale JP, Hay DC, Fowler PA, Huestis MA. Quantification of ethyl glucuronide, ethyl sulfate, nicotine and its metabolites in human fetal liver and placenta. *Forensic Toxicology* 2017; online ahead of print.

Powers D, Erickson S, **Swortwood MJ**. Quantification of morphine, codeine, and thebaine in home-brewed poppy seed tea by LC-MS/MS. *Journal of Forensic Sciences* 2017; online ahead of print.

Lucendo-Villarin B, Filis P, **Swortwood MJ**, Huestis MA, Meseguer-Ripolles J, Cameron K, Iredale JP, O'Shaughnessy PJ, Fowler PA, Hay DC. Modelling foetal exposure to maternal smoking using hepatoblasts from pluripotent stem cells. *Archives of Toxicology* 2017; 91(11):3633-3643.

Newmeyer MN, **Swortwood MJ**, Abulseoud OA, Huestis MA. Subjective and physiological effects, and expired carbon monoxide concentrations following smoked, vaporized, and oral cannabis administration. *Drug and Alcohol Dependence* 2017; 175:67-76.

Newmeyer MN, **Swortwood MJ**, Andersson M, Abulseoud OA, Scheidweiler KB, Huestis MA. Cannabis edibles: Blood and oral fluid cannabinoid pharmacokinetics and evaluation of oral fluid screening devices for predicting Δ^9 -tetrahydrocannabinol in blood and oral fluid following cannabis brownie administration. *Clinical Chemistry* 2017; 63(3):647-662.

Newmeyer MN, **Swortwood MJ**, Taylor ME, Abulseoud OA, Woodward TH, Huestis MA. Evaluation of divided attention psychophysical task performance and effects on pupil sizes following smoked, vaporized, and oral cannabis administration. *Journal of Applied Toxicology* 2017; 37(8):922-932.

Swortwood MJ, Newmeyer MN, Abulseoud OA, Andersson M, Barnes AJ, Scheidweiler KB, Huestis MA. On-site oral fluid Δ^9 -tetrahydrocannabinol (THC) screening after controlled smoked, vaporized, and oral cannabis administration. *Forensic Toxicology* 2017; 35(1):133-145.

Andersson M, Scheidweiler KB, **Swortwood MJ**, Sempio C, Huestis MA. Long term stability of cannabinoids in oral fluid after controlled cannabis administration. *Drug Testing and Analysis* 2017; 9(1):143-147.

Newmeyer MN, **Swortwood MJ**, Barnes AJ, Abulseoud OA, Scheidweiler KB, Huestis MA. Free and glucuronide blood cannabinoids' pharmacokinetics after controlled smoked, vaporized and oral cannabis administration in frequent and occasional cannabis users: Identification of recent cannabis intake. *Clinical Chemistry* 2016; 62(12):1579-1592.

Swortwood MJ, Newmeyer MN, Abulseoud OA, Scheidweiler KB, Huestis MA. Cannabinoid disposition in oral fluid after controlled smoked, vaporized, and oral cannabis administration. *Drug Testing and Analysis* 2016; 9(6):905-915.

Jansson LM, Velez M, Tuten M, Spencer N, McConnell K, Harrow C, **Swortwood MJ**, Barnes AJ, Scheidweiler KB, Huestis MA. Maternal buprenorphine maintenance and lactation. *Journal of Human Lactation* 2016; 32(4):675-681.

Wiegand SL, **Swortwood MJ**, Huestis MA, Vora NL. Naloxone and metabolites quantification in cord blood of prenatally exposed newborns and correlations with maternal concentrations. *American Journal of Perinatology Reports* 2016; 6:e385-e390.

Swortwood MJ, Scheidweiler KB, Barnes AJ, Jansson LM, Huestis MA. Simultaneous quantification of buprenorphine, naloxone and phase I and II metabolites in plasma and breastmilk by LC-MS/MS. *Journal of Chromatography A* 2016; 1446:70-77.

Swortwood MJ, Ellefsen KN, Wohlfarth A, Diao X, Concheiro M, Kronstrand R, Huestis MA. First metabolic profile of PV8, a novel synthetic cathinone, in human hepatocytes and urine by high-resolution mass spectrometry. *Analytical and Bioanalytical Chemistry* 2016; 408(18):4845-4856.

Swortwood MJ, Carlier J, Ellefsen KN, Wohlfarth A, Diao X, Concheiro M, Kronstrand R, Huestis MA. In vitro, in vivo and in silico metabolic profiling of α -pyrrolidinopentiothiophenone, a novel thiophene stimulant. *Bioanalysis* 2016; 8(1):65-82.

Ellefsen KN, Wohlfarth A, **Swortwood MJ**, Diao X, Concheiro M, Huestis MA. 4-Methoxy- α -PVP: in silico prediction, metabolic stability, and metabolite identification by human hepatocyte incubation and high-resolution mass spectrometry. *Forensic Toxicology* 2016; 34:61-75.

Karshner EL, **Swortwood MJ**, Hirvonen J, Goodwin RS, Bosker WB, Ramaekers JG, Huestis MA. Extended plasma cannabinoid excretion in chronic frequent cannabis smokers during sustained abstinence and correlation with psychomotor performance. *Drug Testing and Analysis* 2016; 8(7):682-689.

Swortwood MJ, Hearn WL, DeCaprio AP. Cross-reactivity of designer drugs, including cathinone derivatives, in commercial enzyme-linked immunosorbent assays. *Drug Testing and Analysis* 2014; 6(7-8):716-727.

Swortwood MJ, Boland DM, DeCaprio AP. Determination of 32 cathinone derivatives and other designer drugs in serum by comprehensive LC-QQQ-MS/MS analysis. *Analytical and Bioanalytical Chemistry* 2013; 405(4): 1383-1397.

PRESENTATIONS

M.A. Huestis, R.L. Hartman, **M.J. Swortwood**, B.K. Logan. Cannabis impaired driving: Biological markers and behavioral indicators of recent cannabis intake. SYMPOSIUM. American Association for Clinical Chemistry Annual Scientific Meeting. San Diego, CA. August 2017.

M.J. Swortwood, A.J. Barnes, K.B. Scheidweiler, L.M. Jansson, M.A. Huestis. Buprenorphine and metabolites in paired breast milk and maternal and infant plasma specimens. ORAL PRESENTATION. American Academy of Forensic Sciences Annual Conference. New Orleans, LA. February 2017.

M.J. Swortwood, M.N. Newmeyer, O.A. Abulseoud, K.B. Scheidweiler, M.A. Huestis. Cannabinoid pharmacokinetics and detection windows in oral fluid after controlled smoked, vaporized, and oral cannabis administration. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Dallas, TX. October 2016.

M.J. Swortwood. Opioid addiction treatment in pregnant and nursing women. ORAL PRESENTATION. Women in Science Seminar Series. National Institutes of Health Intramural Research Program. Baltimore, MD. May 2016.

M.J. Swortwood, K.B. Scheidweiler, S.L. Wiegand, and M.A. Huestis. Simultaneous, direct quantification of plasma buprenorphine, naloxone and phase I and II metabolites by LC-MS/MS. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Atlanta, GA. October 2015.

M.J. Swortwood, K. Ellefsen, A. Wohlfarth, M. Concheiro, M.A. Huestis. First metabolic profile of PV8, a novel synthetic cathinone, by high-resolution mass spectrometry (HRMS). ORAL PRESENTATION. The International Association of Forensic Toxicologists Annual Meeting. Florence, Italy. September 2015.

M.L. Smith, D.A. Haak, R.J. Nadeau, M.A. Moser, R. Flegel, D.A. Gorelick, M.N. Newmeyer, M. Concheiro, **M.J. Swortwood**, M.A. Huestis. Urinary Methamphetamine and Amphetamine Isomer Concentrations Following Controlled Vicks VapoInhaler Administration. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Grand Rapids, MI. October 2014.

M.J. Swortwood, G.W. Hime, D.M. Boland. Designer Drug Trends in Miami: Post-Mortem Case Reviews. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Orlando, FL. October 2013.

M.J. Swortwood, A.P. DeCaprio. Cross-Reactivity of Cathinone Derivatives and Other Designer Drugs in Commercial Immunoassays. ORAL PRESENTATION. International Forensic Research Institute Annual Forensic Science Symposium. Miami, FL. March 2013.

M.J. Swortwood, W.L. Hearn, A.P. DeCaprio. Cross-Reactivity of Cathinone Derivatives and Other Designer Drugs in Commercial Enzyme-Linked Immunosorbent Assays. ORAL PRESENTATION. American Academy of Forensic Sciences Annual Conference, Washington, DC. February 2013.

M.J. Swortwood, D.M. Boland, A.P. DeCaprio. Designer Drug Analysis in the United States. ORAL PRESENTATION. Forensic and Clinical Toxicology Association Designer Drugs Workshop. Hobart, Tasmania. September 2012.

M.J. Swortwood, D.M. Boland, A.P. DeCaprio. Determination of Designer Drugs in Post-Mortem Blood by LC-MS/MS Analysis. ORAL PRESENTATION. Australia-New Zealand Forensic Science Society Annual Symposium. Hobart, Tasmania. September 2012.

M.J. Swortwood, D.M. Boland, A.P. DeCaprio. Determination of Designer Drugs in Post-Mortem Blood by LC-QQQ-MS/MS Analysis. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Boston, MA. July 2012.

M.J. Swortwood. Targeted LC-QQQ-MS Screening of Cathinone Derivatives and Other Designer Drugs in Serum. ORAL PRESENTATION. Forensics eSeminar Series for Agilent Technologies. *Online*. April 2012.

M.J. Swortwood, A.P. DeCaprio. Determination of Cathinone Derivatives and Other Designer Drugs in Serum by Comprehensive LC-Triple Quadrupole MS/MS Analysis. POSTER. Society of Forensic Toxicologists and The International Association of Forensic Toxicologists Joint Meeting. San Francisco, CA. September 2011.

ABSTRACTS

D. Powers, S. Erickson, **M.J. Swortwood**. The morphine in your pantry – Understanding overdose risk of home-brewed poppy seed tea. ORAL PRESENTATION. American Academy of Forensic Sciences Annual Conference. Seattle, WA. February 2018.

M.N. Newmeyer, **M.J. Swortwood**, O.A. Abulseoud, K.B. Scheidweiler, M.A. Huestis. Blood and oral fluid cannabinoids' pharmacokinetics and the evaluation of two on-site oral fluid (OF) screening devices for the prediction of Δ^9 -tetrahydrocannabinol (THC) in oral fluid and blood following edible cannabis administration. ORAL PRESENTATION. American Academy of Forensic Sciences Annual Conference. New Orleans, LA. February 2017.

M.J. Swortwood, M.N. Newmeyer, O.A. Abulseoud, A.J. Barnes, K.B. Scheidweiler, M.A. Huestis. On-site oral fluid cannabinoid screening after controlled smoked, vaporized, and oral cannabis administration. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Dallas, TX. October 2016.

M.N. Newmeyer, **M.J. Swortwood**, O.A. Abulseoud, M.A. Huestis. Subjective and physiological effects following controlled smoked, vaporized, and oral cannabis administrations to frequent and occasional cannabis smokers. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Dallas, TX. October 2016.

L.M. Jansson, M. Velez, K. McConnell, N. Spencer, M. Tuten, **M.J. Swortwood**, A.J. Barnes, M.A. Huestis. Maternal buprenorphine maintenance and lactation. POSTER. Pediatric Academic Societies Meeting. Baltimore, MD. May 2016.

M.J. Swortwood, M.N. Newmeyer, A.O. Coffay, O.A. Abulseoud, and M.A. Huestis. Neurocognitive Performance in Occasional and Frequent Smokers following Controlled Smoked, Vaporized, and Oral Cannabis Administration. ORAL PRESENTATION. American Academy of Forensic Sciences Annual Conference. Las Vegas, NV. February 2016.

S.L. Wiegand, **M.J. Swortwood**, M.A. Huestis, N.L. Vora. Quantification of naloxone and metabolites in cord blood of prenatally-exposed newborns and correlations with maternal concentrations. POSTER. Society for Maternal-Fetal Medicine Annual Pregnancy Meeting. Atlanta, GA. February 2016.

M.N. Newmeyer, M. Taylor, **M.J. Swortwood**, A.O. Coffay, and M.A. Huestis. Preliminary psychophysical task performance after controlled oral cannabis administration. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Atlanta, GA. October 2015.

M.J. Swortwood, J. Carlier, K.N. Ellefsen, A. Wohlfarth, R. Kronstrand, M.A. Huestis. Metabolic profiling of α -PVT, a novel stimulant thiophenyl analog. ORAL PRESENTATION. Society of Forensic Toxicologists Annual Meeting. Atlanta, GA. October 2015.

C. Sempio, **M.J. Swortwood**, M. Andersson, K.B. Scheidweiler, and M.A. Huestis. Extended cannabinoid stability in authentic oral fluid after controlled cannabis smoking. POSTER. Society of Forensic Toxicologists Annual Meeting. Atlanta, GA. October 2015.

K. Ellefsen, **M. Swortwood**, A. Wohlfarth, M. Concheiro, and M.A. Huestis. 4-methoxy- α -PVP: In silico metabolite prediction, assessment of metabolic stability with human liver microsomes and metabolite identification after human hepatocyte incubation with high resolution-mass spectrometry. ORAL PRESENTATION. American Academy of Forensic Sciences Annual Conference, Orlando, FL. February 2015.

A.P. DeCaprio, A. Broomes, J.Z. Seither, **M.J. Swortwood**, L.E. Arroyo. Broad-Based Screening of Bath Salts, Synthetic Cannabinoids, and Other Designer Drugs by LC-QQQ-MS and LC-QTOF-MS. ORAL PRESENTATION. International Forensic Research Institute Annual Forensic Science Symposium. Miami, FL. March 2013.

J. Batson, M. Witkowski, S. Andria, M. Fulcher, **M. Swortwood**. Real or Fake?? – The Screening of Pharmaceutical Drugs with Handheld Raman Spectroscopy to Determine Authenticity. POSTER. Federation of Analytical Chemistry and Spectroscopy Societies Annual Conference. Louisville, KY. October 2009.

TESTIMONY

Drugged Driving: Oral Fluid Tests Pilot Program. Senate Bill 970/House Bill 1367, Maryland Senate, Judicial Proceedings Committee Hearing, February-March, 2016.

CONTINUING EDUCATION

Agilent LC-QQQ Techniques and Operation with MassHunter <i>32 hours; January 10-13, 2017; Agilent Technologies, Lexington, MA.</i>	2017
Postmortem Interpretation of Toxic Pharmacodynamic Drug Interactions <i>3.5 hours; October 18, 2016; Society of Forensic Toxicologists, Dallas, TX</i>	2016
Toxicology of Designer Benzodiazepines and Opioids <i>3.5 hours; October 17, 2016; Society of Forensic Toxicologists, Dallas, TX</i>	2016
Scientists Teaching Science Pedagogy Course <i>40 hours; April 1 – June 3, 2016; STEM Education Solutions, online</i>	2016
Postmortem Toxicology: From Autopsy to Interpretation <i>7 hours; October 19, 2015; Society of Forensic Toxicologists, Atlanta, GA</i>	2015

Managing a Forensic Toxicology Laboratory: A New Mindset and Approach <i>7 hours; October 19, 2015; Society of Forensic Toxicologists, Atlanta, GA</i>	2015
Laboratory Accreditation: A Look at Accrediting Bodies and the Top 10 Assessment Findings <i>4 hours; October 20, 2014; Society of Forensic Toxicologists, Grand Rapids, MI</i>	2014
A Practical Approach to Calculating and Reducing Uncertainty of Measurement in the Laboratory <i>4 hours; October 20, 2014; Society of Forensic Toxicologists, Grand Rapids, MI</i>	2014
The Drug Recognition Expert (DRE) Program with Demonstration DRE Evaluation and Mock Court <i>8 hours; October 21, 2014; Society of Forensic Toxicologists, Grand Rapids, MI</i>	2014
Advances in the Solid Phase Extraction of THC and Complex Matrices <i>3 hours; July 16, 2014; United Chemical Technologies, Inc., Baltimore, MD</i>	2014
Measurement Confidence for the Forensic Laboratory: 100A, 100B, 100C <i>6 hours; July 15-17, 2014; ASCLD/LAB-International, Online</i>	2014
Introduction to Uncertainty in Forensic Chemistry and Toxicology 1, 2, & 3 <i>3 hours; May 2014; Research Triangle Institute & National Institute on Justice, Online</i>	2014
AmaZon SL LC/MS Operator Course <i>24 hours; May 29-31, 2013; Bruker Daltonics, Inc., Miami, FL</i>	2013
Method Development of Sample Preparation in Complex Matrices using SLE <i>16 hours; November 2012; Biotage, Miami, FL</i>	2012
Police MedicoLegal Investigation of Death <i>40 hours; April 2012; Miami-Dade County Medical Examiner, Miami, FL</i>	2012
Spice: Detection in Various Biological Matrices <i>4 hours; September 27, 2011; Society of Forensic Toxicologists, San Francisco, CA</i>	2011

HONORS AND AWARDS

Educational Research Award; <i>Society of Forensic Toxicologists</i>	2016
Randox Toxicology Ltd. Travel Grant	2013
Forensic Science Foundation Student Affiliate Scholarship	2012
Scholarly Forum, 1 st Place Award for Poster in Forensics Category; <i>Florida International University</i>	2012
Outstanding Forensic Chemistry Teaching Assistant for 2009-2010; <i>Florida International University</i>	2010

PROFESSIONAL MEMBERSHIPS

Organization of Scientific Area Committees, Toxicology Subcommittee **2017 – Present**

- Affiliate Member
- Task Group Participant: Minimum Testing Requirements in Forensic Toxicology

Society of Forensic Toxicologists **2011 – Present**

- Student Member (2011 – 2015)
- Full Member (2015 – present)

American Academy of Forensic Sciences **2011 – Present**

- Student Affiliate (2011 – 2015)
- Associate Member (2015 – present)

American Chemical Society **2010 – 2015**

- Student Member (2010 – 2015)

PROFESSIONAL LICENSES AND PERMITS

Blood Alcohol Analyses, Florida Department of Law Enforcement **2013 – 2014**

FUNDED GRANTS

Swortwood MJ. Prevalence of Novel Psychoactive Substances in Oral Fluid. National Institute of Justice Research and Development in Forensic Science for Criminal Justice Purposes. Federal Grant Number 2017-R2-CX-0019. \$311,221. Principle Investigator.

Palmquist KB, **Swortwood MJ.** Method Development and Validation for the Screening of Fentanyl and Eight Analogs in Whole Blood Using LC-QTOF Analysis. Forensic Science Foundation Lucas Research Grant Program. 2017-2018. \$4,800. Faculty Advisor.

Swortwood MJ. Quantification of Novel Psychoactive Substances in Oral Fluid. Sam Houston State University Enhanced Research Grant. 2017-2018. \$15,000. Principal Investigator.

DeCaprio AP, Hearn WL, **Swortwood MJ.** Comprehensive Forensic Toxicological Analysis of Designer Drugs. National Institute of Justice Applied Research and Development in Forensic Science for Criminal Justice Purposes. Federal Grant Number 2011-DN-BX-K559. \$143,225. Graduate Researcher.

EDITORIAL BOARDS

IL Journal of Forensic Science and Medicine **2017 – present**

Journal of Forensic Sciences and Digital Investigation **2017 – present**