



TOXTALK®

TOXTALK® Editor

Dwain Fuller, B.S., F-ABFT, TC-NRCC

Associate Editor

Laura Liddicoat, B.S.



Editor Emeritus

Yale Caplan, Ph.D., F-ABFT

Section Editors

Sherri Kacinko, Ph.D., F-ABFT

Matthew Barnhill, Ph.D., F-ABFT

Laureen Marinetti, Ph.D., F-ABFT

Publishing Assistants

Kayla Ellefsen, Ph.D.

Patty Pisana, B.S.

SOFT 2017 Board of Directors

PRESIDENT

Bruce Goldberger, Ph.D., F-ABFT

VICE PRESIDENT

Michelle Peace, Ph.D.

SECRETARY

Dwain Fuller, B.S., F-ABFT, TC-NRCC

TREASURER

Sumandeep Rana, Ph.D.

DIRECTORS

Matthew Juhascik, Ph.D., F-ABFT

Amy Miles, B.S.

Robert Sears, M.S., F-ABFT

Denice Teem, B.S.

Erin Spargo, Ph.D., F-ABFT

PAST PRESIDENT

Jennifer Limoges, M.S., DABC

EX OFFICIO

Dwain Fuller, B.S., F-ABFT, TC-NRCC

Matthew Juhascik, Ph.D., F-ABFT

WEBMASTER

Matthew Juhascik, Ph.D., F-ABFT



PRESIDENT'S MESSAGE

Submitted by Bruce Goldberger, Ph.D., F-ABFT

As I was preparing my message for ToxTalk®, I had an opportunity to read an article published in the New York Times titled “Drug Deaths in America are Rising Faster than Ever” (June 5, 2017). According to the article, drug overdose deaths in 2016 will likely exceed 59,000. The rapid rise in overdose deaths is attributable in part to the emergence of fentanyl analogs. Further, heroin, cocaine and methamphetamine overdose deaths are on the rise as well. The increase in drug overdose deaths is a great burden on our labs’ resources including budget, facilities, equipment and personnel.

In response to the opioid epidemic, SOFT has begun to forge new and vital relationships. In March, SOFT Vice President Michelle Peace and I met with representatives from many Federal agencies engaged in the drug epidemic including the Centers for Disease Control and Prevention, U.S. Customs and Border Protection, U.S. Department of Homeland Security, U.S. Department of Justice, Drug Enforcement Administration, National Institute of Justice, National Institute of Standards and Technology (NIST) and Office of National Drug Control Policy. A follow-up meeting will be held in the Fall. Further, many of our members are stakeholders in newly formed local and state partnerships tasked with the assessment of the opioid epidemic and the development of strategies to save lives.

The SOFT Executive Committee met face-to-face in Mesa on June 1-2. The meeting was very productive and included a thorough review of the SOFT Bylaws and recently developed administrative and financial proce-

INSIDE THIS ISSUE:

<u>President’s Message</u>	1-2
<u>2017 SOFT/TIAFT Meeting News</u>	3-11
<u>Organization News</u>	13
<u>Case Notes</u>	14-22
<u>Book Review</u>	23
<u>In Memoriam</u>	23-24

PRESIDENT'S MESSAGE (CONTINUED)

dures, a discussion of SOFT Committee business, and a telephone conference with the new SOFT accountant.

In response to the U.S. Department of Justice call for comment on how it should move forward to evaluate and improve the underlying science of forensic evidence; improve the operational management systems of forensic science service providers; and improve the understanding of forensic science by legal practitioners, I submitted the following statement on behalf of SOFT:

The Society of Forensic Toxicologists, Inc. (SOFT) is a not-for-profit professional organization comprised of more than 1,400 practicing forensic toxicologists and others interested in promoting and developing the field of forensic toxicology. The technical specialties include postmortem, human performance, drug-facilitated crime and forensic urine drug testing and evaluation. Through its annual meetings, the Society provides a forum for the exchange of information and ideas among toxicology professionals. The Society values mentoring and professional development, encourages cooperation and collaboration among professionals, sponsors programs, such as workshops, newsletters, and technical publications, all directed toward constantly improv-

ing and expanding the forensic toxicologists' skills and knowledge.

The work of the forensic toxicologist is the identification and quantitation of drugs and drug metabolites in the medicolegal contexts. Forensic toxicologists play a vital role in the support of the health and safety of our communities, which includes interfacing with law enforcement, medical examiners/coroners, the justice system, and public health officials. The most significant challenge is the lack of funding for education, training, instrumentation, new methodology, and personnel.

Rapidly emerging and evolving synthetic drugs, such as synthetic cannabinoids and fentanyl analogs (collectively considered novel psychoactive substances, or NPS), as well as the increased use of prescription drugs, has significantly compromised the ability of forensic toxicology laboratories to support criminal and civil investigations in a timely fashion. This alone creates a profound need for resources to support basic and applied research, expand the scope of testing, increase capacity, acquire instrumentation, and hire personnel. Uniform standards of practice must continue to be developed to facilitate the production of reliable toxicological data among laboratories, both governmental and private. Accreditation of laboratories and certi-

fication of personnel present a long-term cost that must be funded to assure the quality and integrity of investigations.

Members of SOFT are participants in NIST-OSAC (Organization of Standard Area Committees) and the American Standards Board (ASB). In addition, through its participation in a recently formed NPS Working Group, SOFT is committed to cultivating relationships with State and Federal stakeholders to pursue and enhance communications and develop solutions to these national challenges.

Finally, the joint SOFT-TIAFT meeting is only three months away. It will likely be the largest gathering of forensic toxicologists ever, so please consider attending. The Waldorf Astoria Boca Raton Resort and Club is an elegant venue with access to the beach, golf courses and numerous restaurants and a spa. The scientific program includes 17 workshops, as well as 187 platform presentations and 218 poster presentations. The social program includes the Welcome Reception, Beach Party Dinner, Dinner Cruise, and President's Banquet and Closing Ceremony.

If you have any concerns or questions regarding SOFT, please send me a message at brucegoldberger@ufl.edu.



SOFT is now on Facebook! Like our page to keep updated on the latest SOFT news.





SOFT-TIAFT 2017

Sept. 9-14, 2017

Meeting Update

The meeting committee has accomplished a great deal since the last newsletter. Thanks to the hard work of the workshop committee chairs, Diane Boland and Frank Peters, and the volunteers who sent in fantastic proposals, you now have a wide variety of workshops to choose from when you register. Take a look inside to see the schedule and brief descriptions of the workshops or go to the SOFT website for more information. The scientific session chairs, Robert Kronstrand and Robert Johnson, report that more than 500 abstracts were received for con-

sideration in the scientific program! The review of the submissions is almost complete thanks to a large squad of volunteer peer reviewers. Opening ceremony chair, Jeri Roper-Miller, is pleased to announce that the plenary speaker will be John Collins. John spent 20 years as a practicing forensic scientist and later as founder of the Forensic Foundations Group. An enthusiastic speaker, teacher, and writer in the areas of crime laboratory management, quality assurance, and human resource management, his presentation is entitled *Witnesses to Histo-*

ry: Meeting Today's Responsibilities to Tomorrow's Forensic Scientists and he will speak to us about providing effective leadership in our labs as well as in the public domain so that there is better clarity about the role, purpose, and priorities of forensic scientists. Forensic Scientists have to seize the opportunity now, or it will affect us for generations to come. All in all, the indications are this will be a meeting not to be missed. See you in Boca!

Dates to Remember

- Abstract acceptance notification: **June 15, 2017**
- Early Bird Registration Ends: **July 31, 2017**
- Regular Registration Ends: **August 31, 2017**
- Workshop materials due: **August 1, 2017**
- Last day to CANCEL hotel reservations: **August 9, 2017**

Meeting registration can be made through the SOFT Website (<http://www.soft-tox.org>)

Planning Committee

Meeting Hosts

Dr. Ruth Winecker
Dan Anderson

Scientific Program Chairs

Dr. Robert Kronstrand
Dr. Robert Johnson

Workshop Chairs

Dr. Frank Peters
Dr. Diane Boland

Opening Ceremony Chair

Dr. Jeri Roper-Miller

Treasurer

Dr. Marc LeBeau

Exhibitor Liaison

Dr. Jarrad Wagner

Food and Beverage

Ann Marie Gordon
Denice Teem

YFT/SSEP

Andre Sukta

Volunteer Coordinators

Tate Yeatman
Joe Kahl

Website Liaison/ Mobile Application

Dr. Rusty Lewis

Silent Auction

Marissa Finkelstein
Erin Walsh

Fun Run

Nicholas Tiscione

Audio Visual

Frank Wallace

Inside this issue:

Sponsors	4
Workshops	5-6
Meeting Resources	7

A Big Thank You to Our Confirmed Conference Sponsors!

TIER I SPONSORSHIP



TIER II SPONSORSHIP



Tier III Sponsorship



Tier IV Sponsorship

ARK Diagnostics, Inc.
 Indigo BioAutomation
 Lin-Zhi

Tier V Sponsorship

NMS Labs
 SPEware

Workshops

SOFT-TIAFT 2017

#	Title/Abbreviated Abstract (for full abstracts see http://www.soft-tox.org/workshops)
1	Cannabis in DUID Investigations: Cannabis use is a continuous challenge for Driving Under the Influence of Drugs (DUID) casework. As more states legalize the drug, greater numbers of DUID cases are created. In addition, the concentration of the marijuana being sold today is much higher than in years past along with varying routes of administration. Interpreting a THC DUID case has its unique challenges such as the following: tolerance, presentation of impairment during the Standardized Field Sobriety Tests and the Drug Recognition Evaluation and the necessity for the toxicologists to understand the laws within their own state and how that applies to their casework. This workshop will address these issues and provide time at the end for a mock THC DUID trial with various case scenarios. Chairs Colleen E. Scarneo and Amy Miles.
2	When "It" Hits the Fan, Resolve it with Effective RCA: Root Cause Analysis (RCA) is a critical step for determining effective corrective actions following errors or non-conformities in our work. This workshop will demonstrate different approaches forensic toxicology laboratories use in identifying effective solutions to problems that they have encountered; solutions that will realistically minimize the chance of future recurrence of the non-conformity. Discussions will focus on the importance of effective RCAs suggestions on how to create a blame-free environment, how to select the best solutions, guidance on making the RCA a true learning experience, general accreditation requirements, and an overview of the National Commission on Forensic Science's view on RCAs. A significant portion of the workshop will focus on group exercises to facilitate the learning process. Chairs Marc LeBeau and Laurel Farrell.
3	Different Approaches to Evaluate the Prevalence of NPS: In recent years, there has been a huge upsurge in new psychoactive substances (NPS), finding a wide and efficient distribution through the "e-commerce" or specialized shops. This fast growth and structure variability has led to increasing challenges to forensic and clinical laboratories in the identification and quantification of new psychoactive substances. This workshop will explore different strategies that are used in the United States and Europe to investigate the diffusion of NPS in selected scenarios, such as workplace drug testing, electronic music festivals, young consumers, intoxication cases and driving relicensing. The workshop will overview the methods for screening and monitoring the use of NPS in selected populations, focusing on recent developments and challenges of the online monitoring of legal high products, the interpretation of hair samples results, the analysis of wastewater and the combined use of surveys and biological testing. Chairs Alberto Salomon and Kevin Shanks.
4	Quantitative Clinical and Forensic Toxicological Analysis with LC HR-MS: High-resolution mass spectrometry, both based on time-of-flight (TOF) or Orbitrap-type instruments, is increasingly used for quantitative analysis. It offers several advantages over QQQ-MS: easier method development, ease of adding compounds to an existing method without the need for re-validation of the compounds that were already in the method and retrospective analysis for other compounds. Quantification can be based on high-resolution full-scan analysis, selected ion monitoring or multiple reaction monitoring. Examples will be given from forensic and clinical toxicology to include drugs of abuse, anabolic steroids and pharmaceuticals in biological matrices and wastewater. Method validation results will be presented. Chairs Alain Verstraete and Markus Meyer.
5	Making Your Leadership Meaningful and Productive-Part I, Fostering Open Communications and Team Building: Most of us assumed our roles in leadership and management based on our technical performance and our demonstrated leadership. But our continuous improvement requires refined knowledge and skills to be an effective leader. An open communication environment allows employees to trust one another to give honest feedback, to express ideas freely, and to offer a dissenting voice without judgment and reprisal. A team building environment allows employees to work together effectively and is designed to increase motivation and promote cooperation. While we may know that these are needed in the workplace, we may not know how best to achieve and sustain them as a leader. Interactive, practical exercises will focus on group activities to improve team building skills of open communications, building trust, problem/decision making, and adaptability/planning activities. As a leader, what more could you ask for? Chairs Jeri Roper-Miller and Eleuterio Umpierrez.
6	Making Your Leadership Meaningful and Productive-Part II, Leadership within High-stakes Organizations: The National Institute of Justice (NIJ) Forensic Technology Center of Excellence (FTCoE; Award 2016-MUN-BX-K110) is committed to improving the practice of forensic science and strengthening its impact on public agencies dedicated to combating crime. High-stakes organizations are those where perfection is a cultural expectation placed on employees by both upper management and stakeholders. These environments create unique challenges which may include reductions in efficiency and productivity, increases in laboratory turnaround times, increases in the frequency of personnel problems, reduced responsiveness, employee retention problems, increased use of sick leave, and elevated risks of error. This workshop will present specific, actionable strategies that can be adopted to improve all aspects of operations and lower the frequency of behavioral and performance-related problems among laboratory personnel. Chairs Jeri Roper-Miller and Eleuterio Umpierrez.
7	Forensic Epidemiology: Integrating Forensic Medicine and Public Health: Forensic Epidemiology is the study of forensic casework to investigate trends, patterns and risk factors for disease, injury and death. It allows us to draw evidence-based conclusions linking a harmful exposure (e.g. drug use) to a specific outcome (e.g. addiction; fatal toxicity), at an individual or population level. While the primary objective of the medico-legal death investigation is to determine the cause and manner of death, large sets of data are generated over time, providing an opportunity for research integrating Forensic Medicine and Public Health. This Workshop will provide attendees with an introduction to the use of Forensic Toxicology data in epidemiology and how it can be used to inform casework and benefit public health. Attendees will be shown how to perform basic forensic epidemiology research, common measures or outcomes used to best answer research questions; and understanding key data sources with the potential for data linkage. Chairs Jennifer L. Pilgrim and Luke Rodda.
8	Strategies for the Detection of Synthetic Cannabinoids in Biological Specimens: Synthetic cannabinoid receptor agonists, commonly referred to as synthetic cannabinoids (SCs), constitute the largest group of new psychoactive substances (NPS). Although they are marketed as a "safe" and "legal" alternative to marijuana, many reports indicate that many of these compounds may produce serious adverse health effects. The number of SCs, their chemical diversity, the rate at which they emerge and the lack of commercial availability of reference standards for (metabolites of) many compounds: all these factors make it particularly challenging for the toxicologist to keep up with the detection and monitoring of this group of compounds. Moreover, given the high potency of many SCs, they are only present at very low concentrations in biological matrices. This workshop will focus on recent approaches to detect SCs in biological matrices encompass immunoassays, targeted and untargeted (high resolution) mass spectrometry-based methods and bio-assays. Chairs Volker Auwarter and Christophe Stove.

Workshops

#	Title/Abbreviated Abstract (for full abstracts see http://www.soft-tox.org/workshops)
9	Death Investigation, A Step by Step Guide to Postmortem Toxicology: The success of a forensic post-mortem investigation that is suspected to involve drugs or poisons depends on the toxicologist and pathologist/medical examiner working closely together as a team. The pathologist relies on the expertise and experience of the toxicologist and specialized, analytical skills of the toxicology laboratory to provide answers concerning the presence of drugs in autopsy specimens. For this to be successful, the toxicologist relies on the pathologist to provide appropriate specimens for analysis. It is widely acknowledged that post-mortem drug concentrations do not necessarily reflect concentrations at the time of death. The audience will be educated on the importance of appropriate autopsy sample collection, the analytical un-suitability of poor quality samples and the risks associated with offering an interpretation on such samples. The audience will be educated on the added value that multi-sample analysis can provide. Finally, the audience will be educated on how the medical examiner coordinates the death investigation process. Chairs Craig Chatterton and M. David Osselton.
10	In the Cross Hairs with Forensic Toxicology and Hair Analysis: Hair testing for drugs is of growing interest in the forensic science community. The scope of testing ranges from postmortem analysis, to the detection of analytes following a single exposure. Hair analysis has also been used for pre-employment screening, as well as for probationary reasons. Advantages and Disadvantages of hair testing will be discussed. Although hair testing for drugs has been performed globally for decades, it has not taken off in the United States as much as it has elsewhere. Reasons for this may include the fact that testing hair is more complicated than the analysis of traditional toxicology matrices and results of testing may be more challenging to interpret. Chairs Madeline Montgomery and Roman Karas.
11	Drug-Facilitated Crime in the 21st Century: This workshop describes the update of a set of minimum analytical performance limits for the toxicological investigation of suspected Drug-Facilitated Crimes (DFC) as recommended by Society of Forensic Toxicologists (SOFT) Drug-Facilitated Crimes (DFC) committee and the Organization of Scientific Area Committees (OSAC). The workshop will provide examples of the methodologies used by laboratories performing DFC case work and how the performance limits are used to improve the laboratory capabilities in this crucial area of forensic toxicology. The workshop will educate the attendee about the broad scope of DFC cases with specific examples and information regarding the relationship between toxicology and human trafficking. The workshop also presents some of the latest research on ethanol and its effects on memory. Chairs Teri Stockham and Lisa Reidy.
12	From the Street to the Lab, Updated Trends and Case Reports for NPSs: Toxicologists are frequently called upon to determine whether substances played a role in a case. The prevalence of Novel Psychoactive Substances (NPS) has increased the complexities of testing and interpretation of routine case-work. The emergence and widespread availability of these drugs supports the need to continually expand our knowledge in analytical techniques and pharmacology. This workshop will discuss resources for identifying emerging drugs and trends throughout the USA and the world and the analytical challenges faced by a laboratory interested in performing NPS testing. The workshop will then focus on the various classes of NPS. An overview of the pharmacology and case reports of each class will be presented. Finally, in recognition that many of these cases involve poly-drug use, there will be a discussion on cases involving combinations of NPS with common drugs of abuse, prescribed and over-the counter medications. Chairs Sherri Kacinko and Dani C. Mata.
13	Screening by LC-MS/MS: Techniques, Trends and Limitations: Modern MS experiment types such as data independent acquisition in combination with wide(er) MS/MS precursor isolation are recent trends in LC-MS/MS screening. These new techniques provide additional benefits, such as even higher sensitivities and lessen common drawbacks of LC-MS/MS reference databases such as low inter instrument reproducibility. Additionally, modern peak matching algorithms provide better screening results. The aim of the workshop is to provide an overview on different recent low and high-resolution LC-MS/MS screening concepts. Limitations of the applied techniques is provided. Chairs Dirk K. Wissenbach and Herbert Oberacher.
14	Where the Wild Things Are - Method Development: SWGTOX and SOFT have successfully promoted method validation guidelines. However, what happens before validation is critical to smooth and successful validations. Method development is often poorly done making the process much more challenging than is necessary. Whether new instrumentation or increased scope of testing, administrative, managerial and technical requirements must be thoroughly considered. Case working analysts tasked with research and designated research analysts share their contrasting experiences and insights. Instrumentation and methodology-specific developments will be discussed, highlighting the unique solutions to these challenges. Chairs Sue Pearring and Mark Burry.
15	Avoiding Agitation with Method Validation: Several authoritative organizations have proposed guidelines and standard practices for method validation in toxicology laboratories. This workshop is designed to compare some of these different approaches and provide recommendations to streamline the process. Emphasis will be made on how to develop a validation plan, as well as suggestions for addressing unique situations. Attendees will benefit from group exercises that will allow for open discussion as to how to handle several real-life situations when planning validation experiments. Chairs Marc LeBeau and Frank Peters.
16	SWGTOX, OSAC, AND ASB: How The Heck Do They Impact Me? In recent years, several documents have been developed to standardize the field of forensic toxicology. Much of the work in this area in the United States has been done by three groups: SWGTOX, OSAC and ASB. This workshop will give attendees a better understanding of the history of these organizations, the process they follow to develop standards and guidelines, and the planned "roadmap" for the groups. Overviews and the up-to-date status of draft documents will be discussed. Chairs Marc LeBeau, Melissa Kennedy, and Fiona Cooper.
17	Measurement Traceability and Measurement Uncertainty in Forensic Toxicology-An Overview: It is critical that forensic laboratories provide analytical results that are reliable, accurate, and comparable. These are the fundamental reasons for establishing measurement traceability and measurement uncertainty. The workshop will focus on the impact of revisions to ISO/IEC 17025 and the work within the OSAC and the Academy Standards Board to establish documentary consensus standards as it relates to these topics. An overview of the basic process for establishing measurement traceability and estimating measurement uncertainty along with strategies for implementation and presentation in a court of law will be provided. Chairs Tate Yeatman and Nick Tiscione.

SOFT-TIAFT 2017

Where do I find?

Science, Sunshine, & Social Networking

All the information you need from registration to transportation is located on the SOFT website (www.soft-tox.org). Below is a specific list of menu items and links to the information:

- Registration: <http://www.soft-tox.org/registration>
- Workshops: <http://www.soft-tox.org/workshops>
- Agenda: <http://www.soft-tox.org/agenda>
- Fun Run: http://www.soft-tox.org/fun_run
- Conference Center: <http://www.soft-tox.org/hotel>
- Travel Logistics: <http://www.soft-tox.org/travel-logistics>
- Local Attractions: <http://www.soft-tox.org/attractions>
- Silent Auction: <http://www.soft-tox.org/silent-auction>
- Invitation Letter: http://www.soft-tox.org/files/annual_meeting/Invitation_Letter.pdf



Don't see what you need? Contact the SOFT Office at +1.480.839.9106 or email: <http://www.soft-tox.org/contact>

"Calling all volunteers!" Our volunteer coordinators are seeking members to help with the meeting. Email your interest to: volunteers@soft-tox.org



See you in Boca Raton!

Nominating Committee Offers 2018 Slate of Officers

The Nominating Committee's task is to provide a slate of Officers and Directors to the full membership of SOFT at least 30 days prior to the annual Business Meeting, to be held September 14, 2017 in Boca Raton, FL.

The President and Vice President each serve one year terms, while the Secretary serves a two year term which expires on alternate years with the Treasurer. Directors are elected for a three year term.

The 2017 SOFT Nominating Committee comprised of Joe Saady, Jeri Roper-Miller and Chair, Jen Limoges respectfully submit the following slate of Nominations for consideration by the membership:

President
Michelle Peace, Ph.D.

Vice President
**Dwain Fuller, BS, F-ABFT,
TC-NRCC**

Secretary (2 years)
Amy Miles, B.S.

Director (1 year)
**Matthew Juhascik, Ph. D.,
F-ABFT**

Director (3 years)
Tate Yeatman, M.S., F-ABFT



Michelle Peace
Ph.D.
President
(one year term)

Dr. Peace received her B.A. in Chemistry from Wittenberg University, a Master of Forensic Science from George Washington University, and her Ph.D. from the Medical College of Virginia at Virginia Commonwealth University (VCU). The focus of her doctoral work was to study entomological evidence as an alternative matrix for toxicological analyses.

Dr. Peace is a faculty member in the Department of Forensic Science at VCU (FEPAC-accredited). She is one of the founding faculty for the Department, and has served as Associate Chair for 6 years. She also served as the Interim Chair for 4 years, expanding the faculty, physical space, and research initiatives in the Department. Dr. Peace has also served as a manager in a private SAMHSA-accredited forensic urine drug testing laboratory and has worked as a scientist for Procter & Gamble, where she holds 3 patents.

Dr. Peace served on the Scientific Working Group for Forensic Toxicology (SWGTOX) for 4 years to develop standards for the practice of forensic toxicology. She is a member of the Society of Forensic Toxicologists (SOFT) and is its current Vice President, and is a member of the Toxicology Section of the American Academy of Forensic Sciences. She is a member of the National Safety Council's Alcohol, Drugs, and Impaired Driving Division and sits on a new national task

force established by the CDC and DEA to develop solutions to combat the opioid epidemic gripping the United States.

Dr. Peace is currently the PI for an NIH grant studying the efficacy of electronic cigarettes, particularly as they pertain to illicit substance use, and has served as the PI for a sub-grant from NIH's Forensic Technology Center of Excellence at RTI, in which she managed a complex evaluation of crime scene scanners, collaborating with 4 law enforcement agencies.

Dr. Peace has conducted continuing education workshops for professionals internationally and has been a faculty member for 12 years in Virginia's Forensic Science Academy which is a codified program to train law enforcement regarding the identification, collection, and preservation of evidence from a crime scene. She has also developed workshops for primary and secondary education and a community engagement enterprise to address STEM education in middle schools.



Dwain Fuller
**BS, F-ABFT,
TC-NRCC**
Vice President
(one year term)

Mr. Fuller is the Technical Director of the Toxicology and Clinical Mass Spectrometry Laboratories at the Veterans Affairs North Texas Healthcare System in Dallas, Texas, in addition to maintaining an active private consulting practice in forensic toxicology.

Nominating Committee Offers 2018 Slate of Officers (CONTINUED)

Mr. Fuller holds a Bachelor of Science degree in Chemistry from the University of Oklahoma.

Mr. Fuller began his career in forensic toxicology in 1984 as a bench chemist at the Office of the Chief Medical Examiner for the State of Oklahoma. In 1987 he accepted a position as the Assistant Director of Toxicology with Sierra Nevada Laboratories, Inc. Through a series of corporate purchases and mergers, Sierra Nevada Laboratories, Inc. became a Laboratory Corporation of America laboratory. In 1993, Mr. Fuller was promoted to the Director of Toxicology, and became the Responsible Person (RP) for the SAMHSA lab, positions he held until accepting his present assignment in 1998.

Mr. Fuller is certified as a Fellow of the American Board of Forensic Toxicology (ABFT) and a Toxicological Chemist by the National Registry of Certified Chemists (NRCC).

Mr. Fuller is a member of the Society of Forensic Toxicologists (SOFT), where he has twice served as a member of the Board of Directors as well as currently serving as the Secretary. Mr. Fuller is a Fellow of the American Academy of Forensic Sciences (AAFS), where he has served as the Toxicology Section Chair. Mr. Fuller is also a member of the Southwestern Association of Toxicologists (SAT).

Mr. Fuller has served on the Committee for Testing for Intoxication for the State of Nevada and as a panel member on the Governor's

Conference on Safety for the State of Nevada. He has served on the faculty of the University of Texas Southwestern Medical Center at Dallas, as well as a faculty member for numerous courses for the National Judicial College in Reno, Nevada. Additionally, Mr. Fuller has served as a consultant to the Nevada Attorney General and to the U.S. Attorney's Office.

Mr. Fuller has authored or co-authored many papers and articles for both peer-reviewed and popular publications. Mr. Fuller has served as a reviewer for several of the special SOFT, and other editions of the Journal of Analytical Toxicology and currently serves on the SOFT Editorial Board of the Journal of Analytical Toxicology. Mr. Fuller has served as a member of the Document Development Committee on Toxicology and Drug Testing in the Clinical Laboratory of the Clinical Laboratory Standards Institute (CLSI) and currently serves as the Editor of ToxTalk®.

Mr. Fuller has chaired, co-chaired, and lectured at several workshops at annual meetings of AAFS and SOFT as well as presenting technical papers at SOFT, and SAT. Mr. Fuller has extensive experience in consulting and expert testimony in both criminal and civil matters in numerous states.



Amy Miles
B.S.
Secretary
(two year term)

Amy Miles is the Director of the

Forensic Toxicology Program at the Wisconsin State Laboratory of Hygiene (WSLH) and has almost 18 years of experience in forensic toxicology. In addition to managing the Forensic Toxicology Program, Amy provides expert court testimony and interpretation of laboratory reports for coroners, medical examiners, attorneys and law enforcement officers. Amy also provides expert consultation for drug impaired driving cases both locally and nationally. Amy attended the Drug Recognition Expert (DRE) school held in Wisconsin in 2004 and provides training and support for the DRE program not only in Wisconsin but across the country. In 2005 Amy received an award from Citizens Against Drug Impaired Drivers (CANDID) for her outstanding dedication to the DRE program. In the spring of 2017, Amy was awarded the DRE Emeritus Award from the Wisconsin DRE Program for her over 12 years of leadership and dedication to the DREs of Wisconsin. Amy is the toxicology representative on the IACP DRE Technical Advisory Panel.

Amy has given hundreds of presentations on the topic of drugs, alcohol and human performance at state and national conferences and in-service trainings and has contributed several newsletter articles to national publications. Amy is a faculty member of the Robert F. Borkenstein Course: The Effects of Drugs on Human Performance. Amy has been appointed by the Illinois Supreme Court as a Guest Faculty member of the Illinois Judicial Conference Committee on Education. In 2016, Amy testified in front of the Cana-

Nominating Committee Offers 2018 Slate of Officers *(CONTINUED)*

dian Parliament regarding proposed laws pertaining to drug impaired driving. She is a member of several professional organizations and committees that pertain to alcohol, drugs and human performance and is the Chair of the SOFT/AAFS Drugs and Driving Committee and sits on the Board of Directors for the Society of Forensic Toxicologists. Amy is an Associate for the Justice Speakers Institute and in 2010 and 2011 she was given the "Speaker of the Year" Award by the American Association for Clinical Chemistry.



Matthew Juhascik
Ph. D., F-ABFT
Director
(one year term)

Matthew Juhascik is the Chief Toxicologist for the Montgomery County Coroner's Office/Miami Valley Regional Crime Laboratory. His current duties include oversight of the toxicology laboratory which handles casework involving drug-facilitated sexual assault, vehicle operation while under the influence of alcohol and/or drugs, and postmortem testing. He was previously the Deputy Director of Chemistry for the Massachusetts State Police overseeing toxicology, drug chemistry testing for controlled substances seized in the field, and the certification of breathalyzers used in the Commonwealth. He also previously worked as the Deputy Director/QA Officer for the postmortem forensic toxicology laboratory at UMass Memorial Hospital Laboratories in Worcester, MA. He received a B.S. in Chemistry from the Univer-

sity of Dayton in Ohio, and an M.S. degree in Forensic Sciences from the University of Illinois-Chicago. His Ph.D. was also from the University of Illinois-Chicago with a thesis on drug-facilitated sexual assault. His current research interests include method development/validation, LC/MS/MS and epidemiology of drug use.



Tate Yeatman
M.S., F-ABFT
Director
(three year term)

Tate Yeatman is the Chemistry and Toxicology Unit Manager for the Palm Beach County Sheriff's Office Crime Laboratory where he has worked since 2005. Previously, he was employed by the Florida Department of Law Enforcement Crime Laboratory as a Forensic Toxicologist for over 8 years and has testified as an expert in Forensic Toxicology and Forensic Drug Chemistry in over 200 DUI trials throughout Florida. He also works as a teaching assistant and instructor for the University of Florida's Forensic Science Online Program offering Master's degrees in Forensic Science, Forensic DNA & Serology, Forensic Toxicology, and Forensic Drug Chemistry.

Mr. Yeatman earned a Bachelor's degree in Chemistry from the University of Central Florida and a Master of Science degree in Forensic Toxicology from the University of Florida. He is board certified as a Fellow in Forensic Toxicology by the American Board of Forensic Toxicologists and as a Fellow in Drug Chemistry by the American

Board of Criminalists. Mr. Yeatman is also a certified technical assessor for the ANSI-ASQ National Accreditation Board (ANAB).

Mr. Yeatman has co-authored numerous peer-reviewed papers in scientific journals and his work has been presented at national meetings including the American Academy of Forensic Scientists (AAFS) and the Society of Forensic Toxicologists. In addition to SOFT, he is a member of The International Association of Forensic Toxicologists, the American Society of Crime Laboratory Directors, and a member of the Toxicology Section of AAFS. Mr. Yeatman has been appointed to numerous State and National Forensic Science committees including appointments to the Organization of Standard Area Committees (OSAC) Toxicology Subcommittee, the National Commission on Forensic Science (NCFS) Human Factors Subcommittee, and the AAFS Academy Standards Board Toxicology Consensus Body.



2017 SOFT/TIAFT Young Forensic Toxicologists (YFT) Events

Submitted by the YFT committee

The YFT committee was founded in 2009 to promote education, networking and interaction among young forensic toxicology practitioners. The YFT committee will host four activities at the SOFT/TIAFT 2017 annual meeting in Boca Raton, FL (September 10-14). Questions or comments regarding the SOFT YFT events can be emailed to YFT@soft-tox.org or by visiting our Facebook page <http://www.facebook.com/SOFTYFT>.

We are very excited to be working with the TIAFT Young Scientist (YS) committee this year. The YS committee was founded in 1996 to encourage international collaboration among TIAFT young scientists.

The Young Forensic Toxicologists (YFT)/Young Scientists (YS) Joint Symposium, Sunday Evening (September 10) 6:30 PM – 10:30 PM. The joint SOFT YFT/TIAFT YS Symposium begins this year with a social hour where hors d'oeuvres will be served and professional networking will be encouraged. Next on the agenda is a mentor talk followed by research updates from the winners of the 2016 SOFT Leo Dal Cortivo YFT Awards and the 2016 TIAFT YS Awards, as well presentations from two keynote speakers. Following the presentations, the floor will be open to the audience for a friendly discussion of professional experiences and an opportunity to ask questions of fellow toxicologists. We invite all young forensic toxicologists to participate and extend a special welcome to those who may be attending their first SOFT/TIAFT meeting. The Joint Symposium is free to those pre-registering to attend this event

during their meeting registration online. All attendees to the Joint Symposium must be 41 years of age or under.

The Student Enrichment Program (SEP), Monday (September 11) 8am-5pm. The YFT Committee hosts a day long Student Enrichment Program (SEP) targeting undergraduates and graduate students interested in forensic toxicology. Students will learn about various disciplines within forensic toxicology and what knowledge and skills are necessary for this career path from practicing forensic toxicologists. The program is free of charge, but space is limited. Interested students should apply through our website: <http://www.soft-tox.org/YFT>.

Fifth Annual Professional Development Fair, Monday (September 11) 6:30pm-8pm on the way into the Exhibit Hall during the Welcome Reception. This gathering will have representatives of various accreditation agencies, certifying agencies, graduate programs and laboratories. The goal is to provide information about:

- Board Certification
- Continuing Education
- Professional Training
- Academic Programs
- Advanced Degree Programs
- Career Opportunities

Although the event is hosted by the YFT, the event targets toxicologists at all levels in their careers and is open to all meeting attendees. All meeting attendees are encouraged to attend the Professional Development Fair to learn more about the professional development opportunities available to forensic toxicolo-

gists. We are pleased to be able to provide this opportunity as a complimentary part of meeting registration. Organizations representing programs offering professional development opportunities may reserve a booth (at no cost) for this one night fair by contacting the YFT committee through email at YFT@soft-tox.org by August 1, 2017. Please note that there are a limited number of spaces available and they may go quickly. Participants will be provided a bulletin board; and table space (if available). We believe that this is a great opportunity to showcase your organization and reach out to a target audience in a mutually beneficial way. Please note the individual representing your organization will already need to be attending the SOFT-TIAFT meeting.

The Leo Dal Cortivo Award, Tuesday thru Thursday (September 12-14). The Leo Dal Cortivo Memorial Fund allows the YFT committee to present two awards, each with a cash prize of \$1000 in addition to free registration at a future SOFT meeting. One award will be presented to the best poster presentation and the other for the best oral presentation. To be considered for these awards, the presenting author should mark the box on the abstract submission form that they are eligible for the Leo Dal Cortivo YFT award. The eligible abstracts with the highest scores, as determined by the YFT committee, will be chosen as candidates for the awards. For additional information on Dr. Leo Dal Cortivo, please visit the following website created and updated by his nephew Vincent Fusaro (<http://www.leodalcortivo.com>).

CONGRATULATIONS TO ERA—YSMA AWARDEES!

The SOFT Awards Committee has announced the following Educational Research Award (ERA) and Young Scientist Meeting Award (YSMA) winners for 2017.

The five Awardees (pictured below) will present their research during one of the Scientific Sessions at the September Annual Meeting in Boca Raton, Florida.

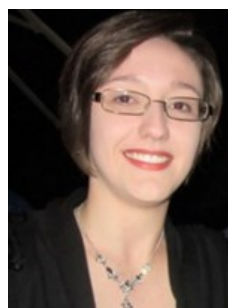
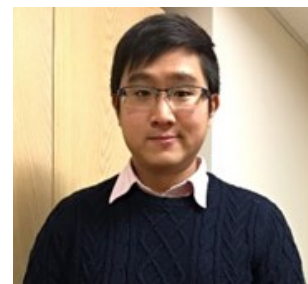
The ERA was established in 1980 to encourage academic training and research in areas of forensic toxicology. The YSMA was established in 2003 to recognize bench level scientists. Both awards allow for a complimentary registration to the annual meeting, PLUS a financial stipend of \$2,000 each. These five awardees will each be presented with an honorary plaque during the Annual SOFT Business Meeting.

The SOFT website (www.soft-tox.org) has a link for eligibility and application information. ALL SOFT MEMBERS are urged to “encourage” co-workers, interns, or students to apply for these prestigious recognition awards. The 2017 Award Committee members are Erin Spargo (Chair), Betsy Spratt, Rusty Lewis, Dani Mata, Sabra Botch-Jones, Robert Johnson, and Robert Kronstrand.



ERA Awardee—**Heather Ciallella**, Arcadia University
 Title of Research: Stability of Mephedrone, Naphyrone, and MDPV in Solvents and NA₂EDTA-Preserved Human Whole Blood
 Mentor: Dr. Karen Scott

ERA Awardee—**Timothy Lau**, Boston University School of Medicine
 Title of Research: Investigation in Stability of Eight Synthetic Piperazines in Human Whole Blood Under Various Storage Conditions Over Time
 Mentor: Ms. Sabra Botch-Jones



ERA Awardee—**Emma Lomas**, University of Huddersfield (UK)
 Title of Research: Investigation of Post-mortem Redistribution from the Bladder Using In-vitro Models
 Mentor: Dr. Peter Maskell

YSMA Awardee — **Michael Fagiola**, Nassau County Medical Examiner
 Title of Research: Broad and Comprehensive Screening of Novel Psychoactive Substances in Post-mortem Matrices by Liquid Chromatography Tandem Mass Spectrometry
 Mentor: Dr. Joseph Avella



YSMA Awardee — **Elisa Shoff**, Miami-Dade Medical Examiner
 Title of Research: Qualitative Identification of Fentanyl Analogues and Other Opioids in Postmortem Cases by UHPLC-Ion Trap-MSⁿ
 Mentor: Dr. Diane Boland

AAFS Annual Meeting News
February 19-24th, 2018 — Seattle, WA
Submitted by Fiona Couper

It's difficult to believe three months have passed since our incredibly successful 2017 Annual Meeting in New Orleans, LA. Our sincerest thanks to all the Toxicology Section officers, chairs, co-chairs, moderators, abstract reviewers, and volunteers for your efforts. Great meetings are impossible without the dedication of so many individuals!

Preparations are well underway for another exciting program at the 2018 Annual Meeting in Seattle, WA, where the chosen theme is "Science Matters."

We are looking forward to a vast array of quality workshops, scientific sessions, breakfasts, and luncheons next year and will also continue the traditional special sessions on Drugs and Driving, Postmortem Pediatric Toxicology and our joint session with the Pathology/Biology Section.

We encourage you to consider abstract submissions and/or identify workshop proposals – now is the time to start! The shared **August 1st deadline** will rapidly approach; please don't delay in contacting section Program Chair **William Johnson** or co-chair **Sherri Kacinko** with your workshop suggestions and other program ideas.

Please note another **August 1 deadline: nominations for section awards**. These awards remain a wonderful way to recognize your fellow colleagues for their contributions and dedication to our field. Contact the Chair of the Toxicology Section Awards and Scholarship Committee, **Graham Jones**, with your nominations.

Moderators and volunteers play a pivotal role in the success of the annual meeting, and both activities count as service to the Academy come promotion time! Volunteering is also an excellent way for new-

comers to get engaged and meet people, so please encourage your colleagues and students to participate – contact **William Johnson** if you're interested in this opportunity. One final reminder: **October 1 is the deadline for membership and promotion submissions.**

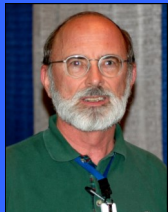
Mark your calendars now for the AAFS 70th Annual Scientific Meeting, February 19 - 24, 2018, in Seattle, WA.



70th Annual Scientific Meeting
 Science Matters

February 19th - 24th, 2018





CASE NOTES

Send interesting "Case Notes" to Section Editor

Matthew Barnhill, Ph.D., F-ABFT

mbarnhilljr@gmail.com

Death Involving Flubromazepam and Methadone

Submitted by Robert Krumsick, B.S.¹, C. Clinton Frazee III, MBA¹,
Diane C. Peterson, M.D.², Robert Pietak, M.D.², Uttam Garg, Ph.D.¹

¹Department of Pathology and Laboratory Medicine, Children's Mercy Hospitals and Clinics,
University of Missouri School of Medicine

²Office of the Jackson County Medical Examiner

Introduction

Recreational use of designer benzodiazepines in the United States has increased substantially since first hitting the market in 2012 [1]. Unlike most benzodiazepines which usually have a relatively low acute toxicity, many of the designer benzodiazepines could pose a risk of severe life-threatening intoxications [4]. The first of these designer benzodiazepines to appear on the market was pyrazolam. Flubromazepam (7-bromo-5-(2-fluorophenyl)-1,3-dihydro-2H-1,4-benzodiazepin-2-one) soon followed and began to appear in online stores in late 2012 [2, 5]. Currently flubromazepam has no medicinal use, and is exclusively manufactured for illicit use [3]. Like other benzodiazepines, flubromazepam elicits sedation, impaired coordination, respiratory depression, muscle relaxation, and CNS depression [2]. One of the most dangerous characteristics of flubromazepam is its extremely long elimination half-life of 106 hours [2]. The long elimination half-life can lead to accumulation of toxic concentrations of the drug after repeated intake. Currently, there is no literature on the therapeutic range or toxic level of

flubromazepam. However, a study conducted on 24 criminal offenders that were positive for flubromazepam showed the drug levels ranging from 4.7 ng/mL to 1200 ng/mL [3]. One of the subjects with a flubromazepam level of 600 ng/mL and no other drugs detected was clinically determined to be mildly impaired. It is not known if the subjects in this study were naïve users of the drug. However, the combination of designer benzodiazepines with other CNS depressants can potentially produce synergistically fatal results. We present a case in which a 62 year old was found unconscious and later died at a nearby hospital. Toxicology findings included flubromazepam, methadone, methadone metabolite, and 7-amino clonazepam.

Case report

A 62 year old male with a history of heart disease, hypertension, diabetes, stroke, drug abuse, anxiety, hepatitis C, depression, and sinus bradycardia was last seen by his wife prior to her going to sleep in their residence. He was later found by his wife at the base of the home's stairs. The subject was taken to a nearby hospital and pronounced dead shortly thereafter.

External examination revealed bruising of the soft tissue of the right upper orbit, blood from the right ear and a palpable subcutaneous defect on the right side of the head. Radiographs of the body revealed multiple cranial fractures involving the right temporal and frontal bones as well as the bilateral parietal bones. Less than 8 hours after death, femoral blood and vitreous samples were collected. All samples were refrigerated until testing was performed.

Experimental

Antemortem blood was not available for testing. Postmortem femoral blood was screened for volatiles by GC-FID headspace. Femoral blood drug screening was performed using Enzyme Multiplied Immunoassay Technique (EMIT). A liquid-liquid alkaline extraction followed by analysis on GC-MS in full scan mode was used as a broad spectrum drug screening for >200 drugs. In this step, presumptive identification of analytes included both a library match with all major ion proportions scrutinized, as well as relative retention time (RRT) comparison with reference standards.

Death Involving Flubromazepam and Methadone (CONTINUED)

The 7-amino clonazepam, methadone and methadone metabolite quantitations were performed on femoral blood using liquid chromatography tandem mass spectrometry (LC-MS/MS). At the time of analysis, we could not locate a reference laboratory which offered confirmation/quantitative testing for flubromazepam. Because of lack of availability of confirmation testing, the presence of flubromazepam was achieved utilizing two separate analytical techniques (GC/MS and LC-QTOF MS). Confirmation of flubromazepam was performed using reference material. Semi-quantitative testing utilizing flubromazepam reference standards spiked at 100 ng/mL, 500 ng/mL, and 1000 ng/mL into blank hemolyzed blood were analyzed with the decedent sample on both EMIT (enzyme mediated immunoassay technique) and GC/MS (gas chromatography/mass spectrometry) to establish a quantitative range for the flubromazepam. Because 7-amino clonazepam was found in the decedent's blood at 20 ng/mL, all standards were spiked with this same level of 7-amino clonazepam to compensate for potential cross-reactivity with the EIA benzodiazepines assay. It should be noted that the packet insert for the benzodiazepines reagent used for the EMIT screen indicates a significant lack of sensitivity to 7-amino clonazepam, and a concentration of 8600 ng/mL is required to elicit a positive response using a lorazepam 300 ng/mL cutoff.

Results

The initial EMIT drug screen was positive for benzodiazepines and methadone. No volatiles were de-

tected. Flubromazepam, methadone, and EDDP (methadone metabolite) were identified on GC/MS based on the RRT and full scan mass spectra. Femoral blood benzodiazepine confirmation was performed at NMS Labs utilizing LC-MS/MS. Although flubromazepam was not one of the benzodiazepines tested, another benzodiazepine, 7-amino clonazepam was found at a low level (20 ng/mL). Methadone and its metabolite EDDP were confirmed at NMS Labs utilizing LC-MS/MS. The methadone level in femoral blood was 380 ng/mL, and EDDP in femoral blood was 30 ng/mL. Flubromazepam, methadone, EDDP, and 7-amino clonazepam were identified on LC-QTOF MS based on the RRT and full scan mass spectra.

Semi-quantitative analysis of the flubromazepam by GC/MS and EMIT both were very comparable. On GC/MS, the patient sample peak area when compared with data from the reference standards was found to be between the 500 ng/mL and 1000 ng/mL standards. It should be noted that at 100 ng/mL, flubromazepam was not identifiable on GC/MS. Analysis performed on EMIT utilizing the same concentration levels produced similar results with the patient sample change of reaction at 0.406 dAbs/m, the 500 ng/mL calibrator change of reaction at 0.401 dAbs/m, and the 1000 ng/mL calibrator change of reaction at 0.453 dAbs/m.

Discussion

The cause of death was traumatic head injury. The manner of death was accident. Based on the semi-quantitative analysis performed, a flubromazepam level between 500

ng/mL and 1000 ng/mL was present in the decedent's femoral blood at the time of death. Although semi-quantitative, this level is substantially higher than "normal" levels reported in literature. In one study, a researcher that ingested a 4 mg capsule of flubromazepam later reached a peak level of 78 ng/mL [2], and in another study involving 24 criminal offenders, a median peak level of 55 ng/mL was determined [3]. Given the aforementioned studies, it seems reasonable to assume that the decedent in our case study may have been experiencing flubromazepam toxicity. While the levels of methadone and flubromazepam found on their own are not fatal in a non-naïve subject, the combination of these two CNS depressants can potentially lead to serious, life threatening side effects. Methadone, due to its partial agonist effect, can decrease respiration through agonist action at the mu receptors in the medullar respiratory center. Benzodiazepines, including the designer benzodiazepines, act synergistically by facilitating inhibition at the GABA receptors and thus, can lead to respiratory arrest, cardiac arrest, coma, and/or death when administered in high concentrations.

Because potential users of flubromazepam may not have experience with the drug and/or the duration of its effects upon the central nervous system, users may incorrectly assume that the drug has been cleared from their system much sooner than is actually true. This, in turn, may result in users who believe themselves no longer under the influence of flubromazepam to unknowingly place themselves in life-

Death Involving Flubromazepam and Methadone (*CONTINUED*)

threatening danger if ingesting other CNS depressants prior to the complete metabolic clearance of flubromazepam.

Conclusion

Presented here is a post-mortem case study demonstrating some of the many dangers associated with illicit designer benzodiazepine use. Though it originally appeared on the market in 1962 [2], little is known about flubromazepam. Literature searches indicate that nearly all studies on flubromazepam have been conducted within the last few years, and presumably because of a notable spike in recreational benzodiazepines use. Individuals who are ingesting this drug are likely doing so with little to no knowledge of important characteristics such as duration of effect and total body clearance. As novel designer benzodiazepines continue to be introduced into the

illicit drug market, it is imperative that toxicology laboratories consider appropriate designer benzodiazepines testing when positive immunoassay benzodiazepine responses are detected, but especially when no conventional benzodiazepines are detected upon confirmation testing [5].

References

1. B. Moosmann, L.A. King, V. Auwarter, Designer benzodiazepines: a new challenge, *World Psychiatry* 14 (2015) 248.
2. B. Moosmann, L. Huppertz, M. Hutter, A. Buchwald, S. Ferlino, V. Auwärter. Detection and identification of the designer benzodiazepine flubromazepam and preliminary data on its metabolism and pharmacokinetics. *J. Mass Spectrom.* 2013, 48, 1150.
3. Hoiseth G, Tuv SS, Karinen R. Blood concentrations of new designer benzodiazepines in forensic cases. *Forensic Sci Int* 2016;268:35-38.
4. Lukasik-Glebocka M, Sommerfeld K, Tezyk A, Zielinska-Psujka B, Panienski P, Zaba C. Flubromazolam--A new life-threatening designer benzodiazepine. *Clin Toxicol (Phila)* 2016;54:66-8.
5. O'Connor LC, Torrance HJ, McKeown DA. ELISA Detection of Phenazepam, Etizolam, Pyrazolam, Flubromazepam, Diclazepam and Delorazepam in Blood Using Immunalysis(R) Benzodiazepine Kit. *J Anal Toxicol* 2016;40:159-61.

A High Profile Case Involving Drugs in Hair Analysis that Demonstrates the Importance of Best Practice in a Forensic Investigation

Submitted by Craig Chatterton, Ph.D., F-ABFT

Introduction: In 2009, the mother of a 2-year-old child was convicted and sentenced to a period of imprisonment based on the interpretation of analytical results obtained by immunoassay analysis of a hair sample. The results of immunoassay analysis were presented as evidence in court during an investigation into the administration of a noxious substance to a 2-year-old child. It was claimed that the immunoassay results showed chronic exposure to cocaine and demonstrated that the child had ingested substantial amounts of cocaine throughout a 15-month period prior.

The immunoassay results obtained in this case were not confirmed by a secondary technique, such as gas or liquid chromatography mass spectrometry (GC-MS, LC-MS). There was no remaining hair sample available for independent analysis and the lack of contemporaneous notes made it impossible to determine whether the hair sample had been washed prior to immunoassay analysis. There was no evidence that sample washings were analysed or retained.

Case History: On the evening of July 31, 2005 a mother rushed her 2-year-old child to hospital because

the child was having a seizure. Presumptive tests of the child's gastric aspirate and urine revealed the presence of cocaine, suggesting the seizures were caused by a cocaine overdose. Eight days later, following medical intervention and treatment – including brain surgery - a sample of the child's hair was seized and subsequently analysed (on two separate occasions) for the presence of cocaine/cocaine metabolite at an accredited biomedical and diagnostic hospital laboratory. The hair sample was not analysed at an accredited forensic toxicology laboratory.

A High Profile Case Involving Drugs in Hair Analysis that Demonstrates the Importance of Best Practice in a Forensic Investigation (*CONTINUED*)

Segment	Cocaine (ng/mg)	Benzoyllecgonine (ng/mg)
0-1 cm	8.37	0.47
1-15 cm	41.00	4.43

Table 1. Laboratory Hair Analysis Results

Segment	Cocaine (ng/mg)	Benzoyllecgonine (ng/mg)
0-1 cm	7.56	1.90
1-2 cm	6.22	4.40
2-3 cm	11.66	11.45
3-4 cm	25.43	16.41
4-5 cm	17.81	11.95
5-6 cm	62.04	24.27
6-7 cm	75.88	35.99
7-8 cm	44.31	34.56
8-9 cm	52.85	32.06
9-10 cm	22.64	20.36
10-11 cm	28.14	14.30
11-12 cm	31.89	11.46
12-13 cm	30.80	14.30
13-14 cm	11.45	4.65
14-15 cm	7.66	4.16

Table 2. Laboratory Hair Analysis Results

Analyses claimed to identify the presence of cocaine and benzoyllecgonine in a hair sample that was collected on August 9, 2005. The immunoassay results (Table 1 and Table 2) were reported by the director of the testing laboratory and interpretation was provided by the director, the assistant director and the laboratory manager. The director and assistant director stated that the child had ingested substantial quantities of cocaine over the course of the previous 15 months.

The choice of analysis: Analytical strategies in forensic toxicology, as well as adjacent disciplines, utilise a variety of procedures, including screening procedures for well-defined subgroups (e.g., drugs of abuse) to be followed by a further process which will provide specific confirmation and quantification of individual compounds.

Drug in hair analysis is an important component of modern forensic science. The hair matrix offers a number of findings that are

not given by other matrices, e.g., oral fluid, urine and blood which can be used to demonstrate only recent drug use; recent being defined as a number of hours or days prior to sample collection. The wide range of detection available through the hair matrix, the ease of sample collection and storage, the stability of the analytes at ambient temperature and the presence of multiple metabolites for some drugs provide and clarify interpretation of results over extended time periods.

A High Profile Case Involving Drugs in Hair Analysis that Demonstrates the Importance of Best Practice in a Forensic Investigation (*CONTINUED*)

There are two primary roles (or applications) for drugs in hair analysis:

1. **Screening** procedures are available that distinguish, on a presumptive basis, between negative (non-users) and positive (users) populations, including individuals who may have been indirectly exposed to drugs.
2. **Forensic** procedures are available **which unequivocally identify and quantify** (where necessary) the drug (or drugs) which have been consumed, knowingly or otherwise by an individual.

Drugs in hair analysis has been utilised and accepted as a powerful evidential tool in many criminal cases in the last decade. For example, major police investigations in the United Kingdom involving Dr Harold Shipman, Shannon Matthews and John Worboys utilised drugs in hair analysis to help prove drug administration to, and/or ingestion by the victim(s) of homicide, abduction and sexual assault respectively.

The circumstances of this case required the use of a 'forensic' analytical investigation as opposed to the less robust, preliminary screening methodology that was utilised by the testing laboratory in order to determine whether the child had ingested cocaine before July 31, 2005 and, if so, for what extended time period. The testing laboratory used immunoassay kits that were targeted to cocaine and benzoylecgonine respectively in this case. Immunoassay is an ana-

lytical technique that is designed to be used only as a form of preliminary screening. The manufacturer's instructions on the kit clearly state that a more specific alternate chemical method must be used to obtain a confirmed analytical result; GC-MS is the preferred confirmatory method. The Society of Hair Testing guidelines support the manufacturer's instructions by stating that, '*All presumptive positive immunoassay screening tests must be confirmed using a more specific test for the target analytes, e.g., mass spectrometry.*'

Accurate quantitative data concerning these drugs cannot be obtained by immunoassay because of the potential for compounds, which are unrelated to cocaine and benzoylecgonine, contributing to the magnitude of a positive result, based on their cross-reactivity. Although the testing laboratory had successfully participated in proficiency testing prior to 2005, there was evidence of both false positive and false negative immunoassay results when data collected post 2005 was compared with external GC and LC-MS testing. In addition, the GC and LC-MS quantitative results varied significantly from results obtained by immunoassay, further demonstrating the limitations of the preliminary screening technique.

Potential sources of contamination: The Society of Hair Testing guidelines for drug testing in hair state that the potential role of external contamination must be considered when interpreting hair testing findings. The washing of hair samples prior to analysis has two main purposes. First, washings remove

hair care products, sweat, sebum or other surface material that may interfere with the analysis or that may reduce extraction recovery. Second, it removes potential external contamination of drugs from the environment.

It should have been determined in this case whether the child's hair sample was contaminated by, for example, vomit, as the medical records reported that the child had vomited. Direct contact between cocaine-contaminated gastric contents and a hair sample will likely result in external contamination which could explain the presence of cocaine and benzoylecgonine along the hair shaft, and could account for the massive quantities. In addition, the child was reportedly sweating profusely which could have affected the results. Cocaine and benzoylecgonine can be detected in hair as a result of direct contact with a cocaine substance. Poor housekeeping and/or smoke produced during drug use should also have been considered.

There were no documented (contemporaneous) notes to demonstrate that the child's hair sample had been washed prior to analysis. During cross examination, the laboratory director was not able to confirm whether the hair sample had been washed and the laboratory manager, the individual who performed the analysis, made no mention of washings during testimony.

If the hair sample was washed, it would be important to have analysed the washings for the presence of cocaine and/or benzoylecgonine. The absence of cocaine

A High Profile Case Involving Drugs in Hair Analysis that Demonstrates the Importance of Best Practice in a Forensic Investigation (CONTINUED)

and/or benzoylecgonine in the washings of a hair sample would demonstrate that no 'surface drug' was present on the sample on the day of its collection; conversely, the presence of cocaine and/or benzoylecgonine in the washings would support the view that the hair sample had been directly exposed to, or in contact with, cocaine and/or benzoylecgonine at some point prior to collection.

Discussion: Interpretation of toxicology data deriving from forensic drug analysis can be a complex process and must consider all the available evidence. Knowledge of clinical observations and substances thought to be involved (including their pharmacology) are important, together with knowledge of the usefulness, applicability and limitations of the different biological specimens and the analytical methodology used.

A valid and reliable interpretation can only be provided if the toxicologist has absolute confidence in all the analytical work and is certain that the integrity of the evidence has not been compromised by mishandling or contamination. The toxicologist must remain impartial and ensure that all conclusions are based on scientifically sound examinations.

It is clear that the original forensic investigation was not appropriate and thorough; a number of reasons why are listed below:

1. The laboratory which undertook the analysis was not an accredited forensic toxicology laboratory. The Society of Hair Testing recommends that la-

boratories which undertake forensic hair analysis are accredited to the ISO 17025 standard.

2. International analytical guidelines were not followed, nor were recommendations concerning presumptive positive immunoassay results, i.e., gas chromatography/mass spectrometry (GC-MS) conducted to obtain a confirmed, quantitative analytical result. The analytical method of choice was inappropriate.
3. International guidelines were not followed concerning pre-analysis washing procedures. Furthermore, the washings (if undertaken in this case) were not analysed to investigate/determine whether the hair contained any surface contaminant.
4. The record and notetaking of the work undertaken by the testing laboratory technicians was inadequate. No contemporaneous notes were available for inspection.
5. No sample of hair was retained for independent analysis.

In October 2014, the court of appeal overturned the cocaine conviction and cleared the child's mother.

The introduction of fresh evidence in this case, which challenged the methods used to collect and prepare the hair sample, criticized the methodology used in the analysis and questioned the validity of the results as given in evidence at trial, resulted in the conviction of administering cocaine over a 14-month period being quashed.

The Honourable Susan Lang, the Independent Reviewer, completed her review and sent her findings to the Attorney General (Ontario) in December 2015.

Related links:

http://www.thestar.com/news/crime/2014/11/01/crack_mom_conviction_tossed_out.html

http://www.thestar.com/news/canada/2014/11/28/ontario_launches_review_of_hair_drug_tests_performed_at_sick_kids.html

<https://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/lang/>



Inadvertent Environmental Transfer of Dextromethorphan from Groom to Racehorse Results in the Establishment of a Pharmacologically Relevant Cutoff.

Submitted by Jacob Machin^a, Theodore F. Shults^b, Clara Fenger^c, and Thomas Tobin^a

^a The Maxwell H. Gluck Equine Research Center, University of Kentucky, Lexington, KY

^b American Association of Medical Review Officers, Durham, NC

^c Equine Integrated Medicine, Georgetown, KY

Kentucky Horse Racing Commission “Dismisses” Three Positives “In the Interest of Fairness to the Trainers and Owners Involved”

Racing chemists and researchers in the area of equine medication struggled for many years to develop sensitive methods to pick up drugs they knew were being improperly used on the racetrack. With earlier technology (GC, GC/MS), finding fentanyl in a horse’s blood or urine was like finding the needle in the haystack, or more accurately the needle in the hay field. Racing chemists, however, have enjoyed the ever improving sensitivity of modern analytical instruments; the GC/MS gave way to the LC/MS, which in turn gave way to tandem mass specs and TOF instruments.

Toxicologists have progressed from micrograms (per milliliter) sensitivity in the 1960’s to nanograms in the 1980’s, picograms in the late 90’s, and now are in the femtogram range of sensitivity. As satisfying as calling a “positive” is for a racing chemist, a critical question either was not asked or was avoided. That question is: “At these lower levels of sensitivity, what are we truly measuring”? Over the years we have also seen an increasing ability to pick up ever smaller trace levels of environmental contamination. When do these two trend lines cross? They

have crossed a number of times (the latest example being dextrophan).

Last month three “positive” dextrophan positive results were “rescinded” by the Kentucky Horse Racing Commission (KHRC) “in the interest of fairness to the trainers and owners involved”.

The Kentucky Horse Racing Commission [KHRC] was responding to data and technical presentations by attorneys Joel Turner and Mike Meuser of Kentucky (who represented the accused trainers) and Professor Steve Barker of Louisiana State University on the complete lack of forensic significance for these trace level dextrophan (a metabolite of dextromethorphan) identifications recovered from post-race urine samples.

The first horse involved in this “Triple Crown” of unsupportable results was Covert Gem, a filly racing at Churchill Downs. Covert Gem was under the care of a groom who was suffering from a cold and taking dextromethorphan (Nyquil). On November 28th, 2015, Covert Gem was shipped from Lexington to Churchill Downs. The groom was with the horse for the entire trip: unloading her at Churchill Downs, leading her to the paddock, assisting with her saddling for the race, and escorting her to the test barn after her first place finish in the sixth race. When the urine

sample was post-race tested in Lexington, KY, it was reported as positive for dextrophan, the phase I metabolite of dextromethorphan recovered from post enzymatic hydrolysis of equine urine.

Soon after, on January 9, 2016 at Turfway Park, a second horse also tested positive for dextrophan. Then at Keeneland on April 21, 2016, a third horse trained by a third individual tested positive for dextrophan, and each was called “positive” by KHRC.

Given the close association between a groom and the horses he or she tends, this type of inadvertent transfer event is not surprising, and likely has been going on since the domestication of the horse. This transfer of low levels of medication is typically unobserved, irrelevant, and pharmacologically insignificant; unless, of course, the horse happens to win a race at Churchill Downs or elsewhere.

As explained to the Kentucky Horse Racing Commission, any trace of dextromethorphan that transfers to or enters a horse is rapidly metabolized; the horse first removes the “methyl” group from dextromethorphan, thereby producing dextrophan. The horse then adds a glucuronide group to the dextrophan, creating dextrophan-glucuronide (see **Figure 1**). Dextrophan-glucuronide is highly water soluble and is rapidly excreted.

Inadvertent Environmental Transfer of Dextromethorphan from Groom to Racehorse (CONTINUED)

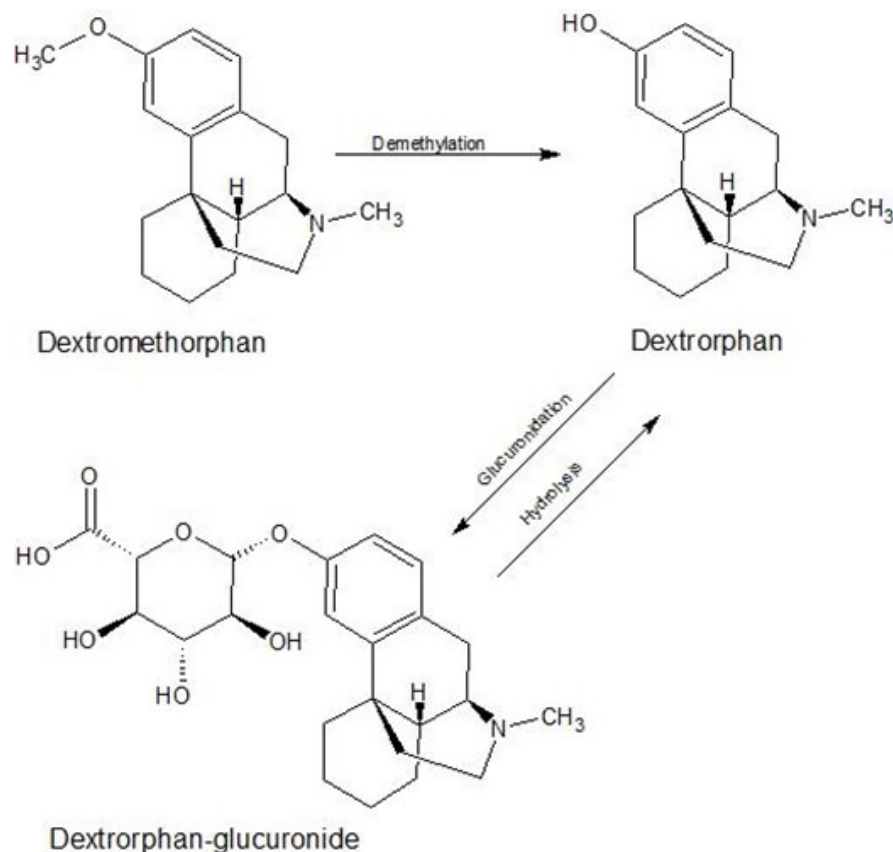


Figure 1: Metabolic Fate of Dextromethorphan shows the structure of Dextromethorphan, Dextrorphan, and Dextrorphan-glucuronide as well as the reactions that interconvert each. In post-race testing, Dextrorphan is measured as the total Dextrorphan recovered from urine following hydrolysis via β -glucuronidase.

ed at high concentrations in the urine. This metabolic pattern of dextromethorphan \rightarrow dextrorphan-glucuronide was first identified in 1983 by Canadian researchers and reported in a Canadian Government publication (Stevenson 1996).

In the fall of 2016, researchers from UC Davis published a similar sequence of experiments. In the UC Davis work, almost four times the Canadian dose of dextromethorphan was administered. The UC Davis horses showed “no significant undesirable behavioral effects” - which we take to mean no observed behavioral effects. As

previously shown by the Canadians, the UC Davis study indicated that dextromethorphan was metabolized to dextrorphan, which was then glucuronidated and excreted at high concentrations in the urine (Corado 2016). Most importantly, traces of dextrorphan persisted in the urine for a relatively long time after a single dose in both the 1983 Canadian and the 2016 UC Davis work.

As described, dextromethorphan is well absorbed orally, rapidly demethylated, glucuronidated, and then very efficiently excreted at high concentrations in the urine. With its relative rapid plasma clear-

ance, it is not clear that dextromethorphan offers any substantial pharmacological activity for the racehorse (Rendon 2001). What is clear, however, is that once a horse comes into contact with dextromethorphan (environmentally or otherwise), the demethylated metabolite (dextrorphan-glucuronide) will readily appear at trace levels in the urine.

The slow, low-level terminal urinary excretion is important. If the environment of the horse happens to contain traces of Nyquil, then small amounts will enter the horse every time it contacts such a trace. These low dextrorphan levels in

Inadvertent Environmental Transfer of Dextromethorphan from Groom to Racehorse (CONTINUED)

the urine can then accumulate over time to a detectable level without the parent drug itself ever coming close to a detectable level in the blood of the horse (much less a pharmacologically relevant one). This pattern accounts for the fact that no dextromethorphan was detected in the blood of Covert Gem, but traces of dextrophan (primarily as the inactive dextrophan-glucuronide) were detected in the urine.

It is also of interest that these three dextrophan identifications in Kentucky racing occurred during the winter/spring season, fully consistent with human cold season Nyquil use. The dextrophan content of the South Platte River (downstream of Denver) also follows this pattern, showing a five-fold higher load of dextrophan during the midwinter months as compared with summer (Thurman 2012). This demonstrates the ubiquitous environmental contamination potential that dextrophan poses, along with its seasonality.

It has been a slow process to educate racing authorities worldwide on the necessity to establish research based pharmacologically relevant cut-off levels for endogenous, dietary and environmental substances [EDEs], something that is taken much more for granted in human drug testing. It is encouraging to see a racing commission establish a de facto environmental substance cut-off for dextrophan in the order of 15 ng/ml in urine, the highest reported urinary concentration in these three environmentally-related dextrophan identifications in Kentucky.

References

Corado, C. R., et al. (2016). "Pharmacokinetics of dextromethorphan and its metabolites in horses following a single oral administration." Drug Testing and Analysis

Rendon, R. A., et al. (2001). "The effect of the NMDA receptor blocker, dextromethorphan, on cribbing in horses." Pharmacology Biochemistry and Behavior **68**(1): 49-51.

Stevenson, A. J. and C. E. D. E.

Program (1996). Analytical Methodology for Detection and Confirmation of Drugs Inequine Body Fluids: Respiratory drugs, Canadian Equine Drug Evaluation Program, Canadian Pari-Mutuel Agency, Agriculture and Agri-Food Canada. (Vol. 2): 87-95

Thurman, E. M. and I. Ferrer (2012). "Liquid chromatography/quadrupole-time-of-flight mass spectrometry with metabolic profiling of human urine as a tool for environmental analysis of dextromethorphan." Journal of Chromatography A **1259**: 158-166.

TOP 10

Reasons you need to **Modernize**
your **Solvent Evaporator**

[CLICK HERE](#)

XcelVap

Horizon
technology

PREPARE FOR BETTER RESULTS

BOOK REVIEW**Disposition of Toxic Drugs and Chemicals in Man 11th edition**

Randall C. Baselt

When Dr. Baselt e-mailed me to inform me that a new edition of his book, *Disposition of Toxic Drugs and Chemicals in Man* had been completed, my initial reaction was amazement. Given the fact that this was the 11th edition and that previous editions of the book have been available to forensic toxicologists since the late 1970s, it is incredible that he has maintained the dedication and stamina to continue this daunting endeavor. This task became even more overwhelming with the advent of the novel psychoactive substance proliferation over the past several years.

There are approximately 1800 monographs in the 11th edition. This is an increase of 275 monographs from the 10th edition. The Table of Contents is 17 pages long, two columns per page, listing all of the monographs. Included are new monographs on drugs of abuse, therapeutic drugs, pesticides, industrial chemicals and dietary supplements. To put this in

a historical perspective, the first edition of the book contained approximately 200 monographs, divided up between centrally-acting and peripherally-acting compounds. As expected, the 11th edition contains both published and unpublished information on newer novel psychoactive substances: bath salts, phenylalkylamines and opioids. There is a single monograph on synthetic cannabinoids as many of these compounds have common metabolic pathways and effects. The structure of the book has remained essentially unchanged throughout the history of the book. Each monograph contains 5 sections: Occurrence and Usage, Blood Concentrations, Metabolism and Excretion, Toxicity, and Analysis. At the end of each monograph is a list of references that enables the reader to seek more information if required. Prior to the monographs, there is a chapter written by Drs. Robert Flanagan and Robin Whelpton on Guidelines for the Interpretation of Analytical Toxicology Results. This first appeared in the 9th edition and

serves to provide context for the information in the monographs. Finally, a new feature in this edition is a table that lists the CAS numbers for all of the compounds in the book. The purpose is to assist the reader in finding the desired monograph.

In the publication announcement, Dr. Baselt stated that "The purpose of this work is to present in a single convenient source the current essential information on the disposition of chemicals and drugs most frequently encountered in episodes of human poisoning." As with previous editions, Dr. Baselt has succeeded in that goal. The forensic toxicology community owes Dr. Baselt an enormous debt of gratitude for his enduring service to the field with his continued work on this book.

Barry Levine, Ph.D.
Office of the Chief Medical
Examiner, State of Maryland

In Memoriam —Robert Charles Meatherall, Ph.D.

Robert Charles Meatherall passed away peacefully on January 28, 2017. Robert is survived by his wife Patricia, daughter Bonnie, son Stephen (his partner Amanda Verhaeghe), and brother-in-law William Stephen. Born July 6, 1947 in London, Ontario, Robert was the only child of Charles and Freda Meatherall, of Ingersoll, Ontario (both deceased) Robert or "Dr. Bob", as he was known to those who worked closely with him, was employed for 38 years as a Clinical Toxicologist at St. Boniface Hospital. He received his Ph.D. in Chemistry from McMaster University in 1974. He was an avid fisherman and curling enthusiast. Robert will be remembered for his wit and wry sense of humour. In lieu of flowers, donations may be made to the ALS Society of Manitoba at www.alsmb.ca

From the Winnipeg Free Press on Feb 01, 2017



In Memoriam —Jesse H. Bidanset, Ph.D., DABFT

Submitted By Joe and Pat Monforte

It is with great sadness that we share with you the news that Jesse H. Bidanset, Ph.D., DABFT, 79, died in Jupiter, Florida, on May 3, 2017. He will be missed as an accomplished colleague and great personal friend.

Dr. Bidanset's participation in the conception and development of the Society of Forensic Toxicologists deserves recognition as a co-founder of SOFT who assisted in hosting the first "Interim Meeting" of toxicologists in Nassau County, NY, in 1970 which is now recognized as the first SOFT meeting. In 1976 Jesse was elected second President of SOFT, and his imprint can be found throughout SOFT's history as an officer, chairman of several committees, meeting participant, and initiator of the SOFT newsletter, ToxTalk®, in 1977, where he served as editor until 1983.



2005 SOFT Meeting with wife, Joan



SOFT Board meeting at the 1981 AAFS Meeting

Many other organizations enjoyed the benefits of Dr. Bidanset's membership, including the American Academy of Forensic Sciences, American Chemical Society, International Association of Forensic Toxicologists, American Academy of Clinical Toxicology, and the Northeast Association of Forensic Scientists. Dr. Bidanset routinely presented and published papers and conducted workshops at local and national meetings. Dr. Bidanset was among the early group of scientists certified as a Diplomate by the American Board of Forensic Toxicologists.

Dr. Bidanset's professional career included Chief Toxicologist at the Nassau County Medical Examiner's Office and faculty member at St. John's University Program in Toxicology. Jesse was one of the first toxicologists to routinely apply radioimmunoassay to the analysis of post-mortem specimens. At St. John's University in New York, Dr. Bidanset was instrumental in establishing a toxicology program which has continued and currently offers B.S. and M.S. degrees in toxicology as well as a Ph.D. in Pharmaceutical Sciences with a concentration in Toxicology.

On a personal note, Jesse was always willing to share his knowledge and friendship. He and his wife, Joan, who preceded him in death, were "regulars" at the SOFT and AAFS meetings always ready to share a handshake or hug, listen to others with sincere interest, and volunteer whenever asked. Jesse will be missed as a friend and a significantly contributing colleague.

A future memorial service and a possible SOFT award in Jesse's name in lieu of flowers are being considered by the family. Details will be shared when available. Meanwhile, condolences may be sent to his daughter, Deborah Bidanset-Ponder, Ph.D., MBA, 3846 White Oak Dr, Vestavia Hills, AL 35343



1990: SOFT PAST-PRESIDENTS

**Society of Forensic Toxicologists,
Inc.**

**1 N. Macdonald St., #204
Mesa, AZ 85201 USA**

**Toll Free Phone: 888-866-7638
Phone / Fax: 480-839-9106
E-mail: office@soft-tox.org**

**Executive Director: Beth Olson
Administrative Assistant: CC Watson**

**SOFT 2017 PLANNING COMMITTEE
MEMBERS**

Meeting Coordinator/Host

Dr. Ruth Winecker
Dan Anderson

Scientific Program Chairs

Dr. Robert Kronstrand
Dr. Robert Johnson

Workshop Chairs

Dr. Frank Peters
Dr. Diane Boland

Treasurer

Dr. Marc LeBeau

Exhibitor Liaison

Dr. Jarrad Wagner

Food and Beverage

Ann Marie Gordon
Denice Teem

YFT/SSEP

Andre Sukta

Volunteer Coordinators

Tate Yeatman

Website Liaison/Mobile Application

Dr. Rusty Lewis

Silent Auction Coordinator

Marissa Finkelstein
Erin Walsh

Fun Run

Nicholas Tiscione

Audio Visual

Frank Wallace

2017 SOFT COMMITTEE CHAIRS

Committee

Committee Chair

ByLaws.....Yale Caplan, Ph.D., F-ABFT
Budget, Finance, and Audit.....Tom Kupiec, Ph.D.
Membership.....Dwain Fuller, B.S., F-ABFT, TC-NRCC
TOXTALK® Editor.....Dwain Fuller, B.S., F-ABFT, TC-NRCC
PublicationsMatt Slawson, Ph.D.
JAT Special Issue.....Dayong Lee, Ph.D., F-ABFT
Awards.....Erin Spargo, Ph.D., F-ABFT
Meeting Resource.....Bruce Goldberger, Ph.D., F-ABFT
Drugs & Driving.....Amy Miles, B.S., Colleen Scarneo, M.S.
Designer Drugs.....Sumandeep Rana, Ph.D.
Policy and Procedure.....Dwain Fuller, B.S., F-ABFT, TC-NRCC
IT Committee.....Matthew Juhascik, Ph.D., F-ABFT
Continuing Education Credit.....Ann Marie Gordon, M.S.
Continuing Education Workshops.....Jayne Thatcher, Ph.D.
Young Forensic Toxicologists.....Andre Sukta, M.S.F.S.
Drug Facilitated Crimes.....Laureen Marinetti, Ph.D., F-ABFT
Ethics.....Jen Limoges, M.S., DABC
Nominating.....Jen Limoges, M.S., DABC
Strategic Planning.....Theodore Shults, M.S., J.D.
Consortium of For. Science Organizations.....Tim Rohrig, Ph.D., F-ABFT
Vendor Liaison.....Jarrad Wagner, Ph.D., F-ABFT

WEBMASTER

Matthew Juhascik, Ph.D., F-ABFT
juhascmp@gmail.com

TOXTALK® Deadlines for Contributions:

February 1 for March Issue

May 1 for June Issue

August 1 for September Issue

November 1 for December Issue

Future SOFT Meeting Destinations:

2017: Boca Raton, FL.....Sept. 10-15, 2017.....Ruth Winecker/Dan Anderson

2018: Minneapolis, MN.....Oct. 7-12, 201.....Loralie Langman/Paul Jannetto

2019: San Antonio, TX.....Oct.13-18, 2019.....Veronica Hargrove/Brad Hall

2020: San Diego, CA.....Sept. 20-25, 2020.....Denice Teem/Dani Mata

TOXTALK® is the official publication of the Society of Forensic Toxicologists, Inc. It is published quarterly for its members. It is each member's responsibility to report change of address and email information to the SOFT Administrative Office. To submit articles, address and email changes, please email TOXTALK@soft-tox.org.

