TOXTALK

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PRESIDENT'S MESSAGE

What a wonderful meeting in San Antonio! If you were unable to attend, you missed a great time of quality science, professional networking, seeing old friends, and making new ones. On a personal level, I was pleased to get to meet several of my Texas colleagues, whose names were already familiar to me, but I had never met. The total meeting attendance was 1089 registered attendees, which I am told is the largest attendance ever for a non-joint meeting. That's fantastic! Thank you to our hosts, Brad Hall and Veronica Hargrove for all your hard work. I also want to thank the planning committee. Scientific Program Chairs: Peter Stout and Dayong Lee, Workshop Chairs: Teresa Gray and Erin Karschner, Exhibitor Liaison: Liz Kiely, Food and Beverage: Ann Marie Gordon and Denice Teem, YFT Chair: Kim Samano, Volunteer Coordinators: Kayla Ellefsen and MacKenzie Dunn, Mobile Application: Rusty Lewis, Roxane M. Ritter, and Sunday Saenz, Audio/Visual: Frank Wallace, and of course, Beth Olson and CC Watson, and all of the SO-SOFTS and other volunteers who gave their valuable time for the cause. Additionally, I would like to once again thank Kayla Ellefsen for serving as the JAT Special Editor.

The scientific portion of the meeting was quite popular, with the workshops selling out quickly. This underscores the desire for continuing education among our membership, an item that SOFT is continuing to address with more regional workshop offerings, the Journal of Analytical Toxicology Editor's Choice CE, and hopefully some online options in the future.

Michelle Peace kicked off the mentoring program at the Young Forensic Toxicologists (YFT) function on Sunday night. I was fortunate to be able to attend and make the acquaintance of a few of our students and younger members. Round two is planned for the American Academy of Forensic Sciences meeting in February. I am excited to see where this goes.

At the business meeting the membership voted for some minor changes to the bylaws, reinstating a "Retired" status in addition to the recently added "Emeritus" status. Additionally, a new

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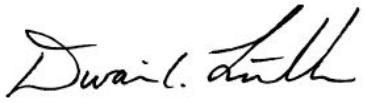
PRESIDENT'S MESSAGE CONTINUED

slate of Officers and Directors were elected. This includes Sumandeep Rana as President, Amy Miles as President Elect, Erin Spargo as Secretary and Fiona Couper, Andre Sukta and Phil Kemp as Directors. Incoming President Rana appointed Mick Smith as Counselor and Luke Rodda as JAT Special Editor.

Additionally, as a reflection of the changing culture of our society as a whole and our greater awareness of such issues as bias, sexual harassment, diversity, etc., I charged the Culture, Values and Diversity Committee with drafting a code of professional conduct, which after being approved by the Board of Directors, each member will be asked to be aware of, and to agree to, when paying dues each year.

This is my last President's Message of my presidency. It has been a sincere honor and privilege to serve as your President this last year. I will continue to remain committed to SOFT and serve the organization in whatever role is appropriate moving forward.

Dwain C. Fuller, F-ABFT, TC-NRCC
SOFT President



Case Study: Postmortem Distribution of 3,4-Methylenedioxymethamphetamine (MDMA) and 3,4-Methylenedioxyamphetamine (MDA) from an Accidental Death Due to MDMA Intoxication

Danylle Kightlinger, B.S. B.S., Lucas Zarwell, M.S., Victor W. Weedn, M.D.; District of Columbia Office of the Chief Medical Examiner, Washington, DC.

Introduction

3,4-methylenedioxymethamphetamine (MDMA), also known as Ecstasy, is a ring-substituted derivative of methamphetamine. It is typically taken in the hydrochloride salt form, ranging in oral doses from 100 – 150 mg. MDMA undergoes N-demethylation metabolism, forming the active metabolite 3,4- methylenedioxyamphetamine (MDA). The effects of MDMA often include: dizziness, hyperactivity, anorexia, headache, anxiety, disorientation, and insomnia (1). Presented is a brief case review highlighting the postmortem distribution of MDMA and MDA in a deceased intoxication victim.

Case Background

A 29-year-old female was found kneeling, face-down on her bedroom floor approximately two hours after her last known communication and pronounced dead on scene roughly 40 minutes later. The scene was unremarkable. Three blister packets of ZzzQuil® (one empty), a bottle of Robitussin®, a pack of oral contraceptives, two prescription bottles (Amoxicillin and Docusate Sodium), wine and beer were the only reported substances found in the apartment. Approximately 18 hours after the decedent was pronounced dead, a medicolegal autopsy was performed and specimens were submitted for toxicological analysis. After results from the initial toxicological case analysis were reported, additional testing was conducted to collect postmortem distribution data of MDMA and MDA.

Methods

A medicolegal autopsy was performed and nine specimens were submitted for toxicological examination: Femoral Blood 1, Femoral Blood 2, Heart Blood 1, Heart Blood 2, Urine, Vitreous Humor, Liver, Brain, and Gastric Content. An expanded postmortem panel was conducted on Femoral Blood 1 which included: headspace gas chromatography (HS/GC), enzyme-linked immunosorbent assay (ELISA), basic screen by gas chromatography-mass spectrometry-nitrogen phosphorous detection (GC/MS/NPD), and drug screen by liquid chromatography-time of flight-mass spectrometry (LC/TOF/MS). Based on the screening results, confirmatory, quantitative analyses by analyte specific liquid chromatography-tandem mass spectrometry (LC/MS/MS) and gas chromatography-mass spectrometry (GC/MS) methods were conducted. Additionally, electrolytes testing was conducted by biosensor analysis. Subsequent to the completion of the routine femoral blood testing, the remaining samples previously submitted to toxicology, were analyzed by GC/MS to gain information about the postmortem distribution of MDA and MDMA.

GC/MS System

An amines analysis (including: amphetamine, methamphetamine, ephedrine, pseudoephedrine, MDA, and MDMA) was performed via liquid-liquid extraction (LLE) with n-butyl chloride followed by heptafluorobutyric anhydride (HFBA) derivatization. The samples were reconstituted in ethyl acetate and analyzed using an Agilent© GC/MS via Agilent MassHunter© data acquisition software in Selective Ion Monitoring (SIM) mode (Tables 1 and 2). The data was then processed using Agilent Chemstation© (Femoral Blood 1) and Agilent MassHunter© (all other samples) software over the dynamic range, 25 - 1000 ng/mL. Upon sampling for extraction, all case specimens were diluted to obtain value(s) within the linear range for MDA and MDMA. Chromatographic separation of amines

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obtained by this method can be seen in Figure 1.

Results

Findings during the medicolegal autopsy included: pulmonary edema (1300 grams combined lung weight), zonal necrosis of the liver (Figure 2 and 3), approximately 25 mL of green material in the stomach (Figure 4), and a contusion on the inner lower lip which is a potential indication of agonal seizure activity (Figures 5).

During the initial toxicological case analysis, four other compounds, in addition to MDMA and MDA, were reported in Femoral Blood 1. Postmortem concentrations of these compounds, excluding MDMA and MDA, were: cocaine detected (ELISA, LC/TOF/MS), 0.03 mg/L benzoylecgonine (ELISA, LC/MS/MS), diphenhydramine detected (GC/MS/NPD, LC/TOF/MS), and 0.005 mg/L alprazolam (ELISA, LC/MS/MS). Additionally, electrolytes analysis was performed on vitreous humor, with results presented in Table 3. After the initial case analysis, additional toxicological analysis for MDMA and MDA was performed for the remaining submitted specimens. The respective postmortem concentrations, as well as MDMA and MDA ratios, for all specimens are presented in the Table 4. With the assumption that the entire gastric contents were submitted to toxicology for analysis, the amount of unabsorbed MDMA still present in the stomach calculated to 19.35 mg (Equation 1).

Discussion

The official cause of death was MDMA intoxication, with the manner of death being accidental. Other drugs detected were not significant in quantity and all electrolyte levels were within normal postmortem limits. The extremely high level of MDMA present in the gastric content suggested the route of administration was oral ingestion. However, no tablets were found in the stomach and the formulation in which the MDMA was ingested – suspected tablet or liquid form – is unknown. MDMA and its active metabolite, MDA, appear to exhibit similar pharmacokinetics, showing a seemingly consistent ratio with respect to the MDA/MDMA concentrations (0.01 – 0.02) in all specimens. The liver and brain concentrations were substantially higher than the femoral blood. The low MDMA concentration present in the urine suggests death occurred soon after ingestion, as is consistent with the case history.

The MDMA postmortem concentrations in this case are some of the highest reported, with many reported MDMA overdose blood concentrations falling below 5 mg/L (1, 2, 3). While femoral blood remains the preferred sample, our data suggests that heart blood concentrations are comparable to femoral blood, indicating heart blood may be used when necessary. This is supported in literature with a reported postmortem distribution, heart/femoral blood concentration ratio average of 2.4 (range 1.0 – 3.9) (1).

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TABLE 1 – *GC/MS Parameters for Amines Quantitation*

Gas Chromatograph Conditions			
Analytical Column	DB-5MS (30 m x 0.25 mm x 0.25 µm film thickness)		
Injection	Splitless		
Injection Temperature	170℃		
Injection Volume	2 µL		
Solvent Delay	8.50 min		
Column Programming	Temp Ramp (℃/min)	Max Temp (℃)	Hold Time (min)
	70	-	1
	10	180	-
	10	205	-
	90	300	-
	Final		
Run Time	17.556 min		
Mass Spectrometer Conditions			
Transfer Temp	280℃		
Source Temp	230℃		
Quad Temp	150℃		
MS Acquisition	SIM		

TABLE 2 – *Quantitation and Qualifier Ions for Amines Quantitation*

Analyte	Quantitation Ion	Qualifier Ion(s)
Amphetamine	240	192, 118
Amphetamine-D_{11} (IStd)	244	128
Methamphetamine	254	210, 118
Methamphetamine-D_{14} (IStd)	261	213
Ephedrine	254	210, 344
Ephedrine-D_3 (IStd)	257	213
Pseudoephedrine	254	210, 344
Pseudoephedrine-D_3 (IStd)	257	213
MDA	240	375, 162
MDA (*urine*)	240	162, *135*
MDA-D_5 (IStd)	244	380
MDMA	254	389, 210
MDMA-D_5 (IStd)	258	394

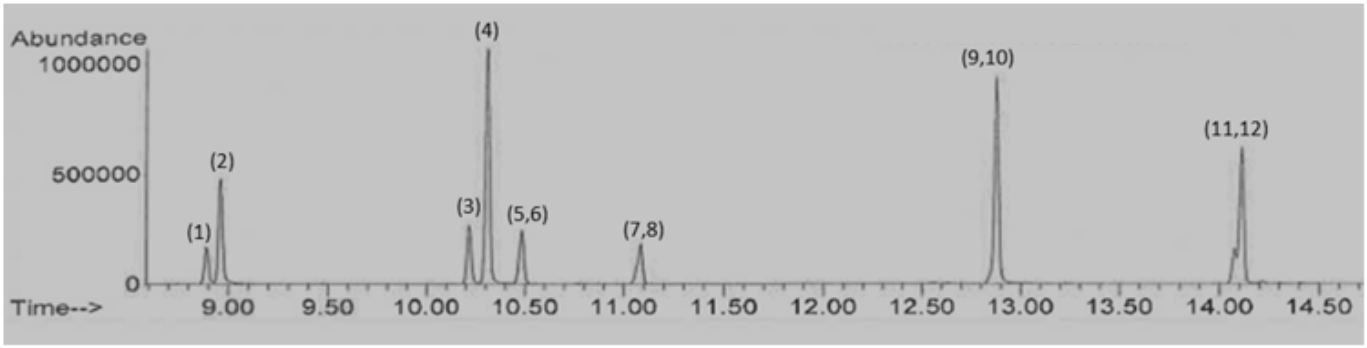

FIG 1 – *Total Ion Chromatogram Separation of Amines in Order of: Amphetamine (1), Amphetamine-D11 (2), Methamphetamine (3), Methamphetamine-D14 (4), Ephedrine (5), Ephedrine-D3 (6), Pseudoephedrine (7), Pseudoephedrine-D3 (8), MDA (9), MDA-D5 (10), MDMA (11), MDMA-D5(12)*

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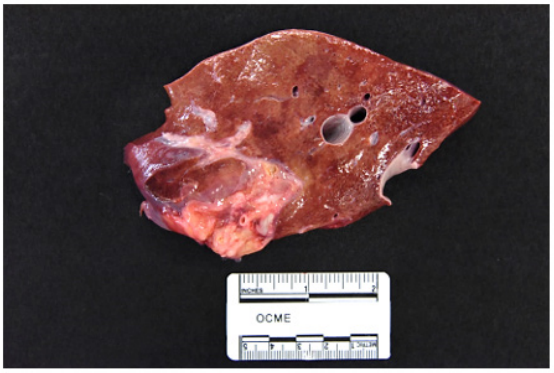

FIG 2 – *Zonal Necrosis of the Liver (1)*

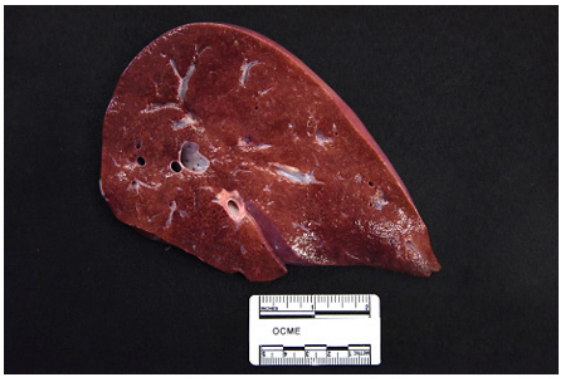

FIG 3 – *Zonal Necrosis of the Liver (2)*

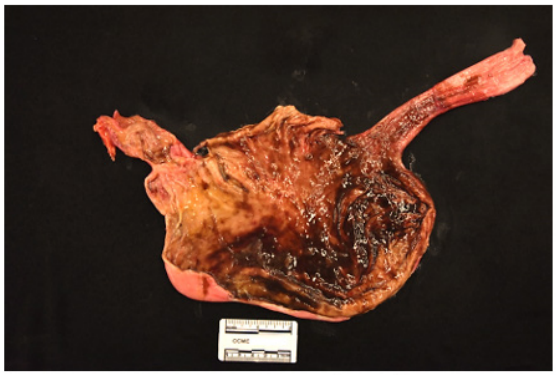

FIG 4 – *Green Material in the Stomach with Gastric Mucosal Hemorrhage*

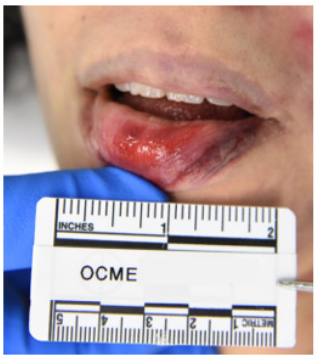

FIG 5 – *Contusion on the Inner Lower Lip*

TABLE 3 – *Electrolytes Results from Vitreous Humor*

pH	Na^+ (mmol/L)	K^+ (mmol/L)	Cl^- (mmol/L)	Glu (mg/dL)	VUN (mg/dL)	Creat (mg/dL)
7.104	136.2	13.88	120.2	24	11	0.6

TABLE 4 – *MDMA and MDA Postmortem Concentrations and Ratios by Specimen*

Sample	MDMA (mg/L or mg/kg)^	MDA (mg/L or mg/kg)^	MDA:MDMA	Fluid or Tissue MDMA: Femoral Blood 1 MDMA	Fluid or Tissue MDA: Femoral Blood 1 MDA
Femoral Blood 1	16.3	0.31	0.01	1.00	1.00
Femoral Blood 2	15.1	0.26	0.01	0.92	0.83
Heart Blood 1	18.0	0.33	0.01	1.10	1.06
Heart Blood 2	18.1	0.28	0.01	1.11	0.90
Urine	5.89	ND*	--	0.36	--
Vitreous Humor	10.3	0.12	0.01	0.63	0.38
Liver	45.9	1.05	0.02	2.81	3.38
Brain	39.7	0.74	0.01	2.43	2.38
Gastric Content	774	ND	--	47.4	--

^ Fluids were reported in mg/L; tissues were reported in mg/kg *ND – Not Determined

EQUATION 1 – *Unabsorbed MDMA in Stomach Contents*

$$25\ mL \times \frac{1\ L}{1000mL} \times \frac{774\ mg}{1\ L} = 19.35\ mg$$

SOFT 2019 MEETING RECAP

SAN ANTONIO, TX • OCTOBER 13-18, 2019

Thank you so much to everyone that attended and participated in the meeting in San Antonio, we hope everyone had a blast! We had a great time serving as your meeting hosts, and we appreciate all of those who provided us encouraging and supportive words throughout the year. With all of the workshops, lunch and learn opportunities, scientific sessions and posters, hopefully everyone left having learned something new but also had time to catch up with old friends and made new friends.

We would like to thank all of the sponsors and vendors that attended and help SOFT make this meeting possible. Special recognition should go to our planning committee for making such a great meeting happen, we could not have done it without them! Thanks to Beth and CC for all of their help and support throughout the year. Finally, thanks to all those who provided constructive feedback through the survey. Your responses are valuable in future meeting planning.

We hope to see everyone again in beautiful San Diego next year!

Brad & Veronica

2019 PLANNING COMMITTEE MEMBERS

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Brad Hall, Ph.D., F-ABFT
Veronica Hargrove, Ph.D., F-ABFT

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BUSINESS MEETING

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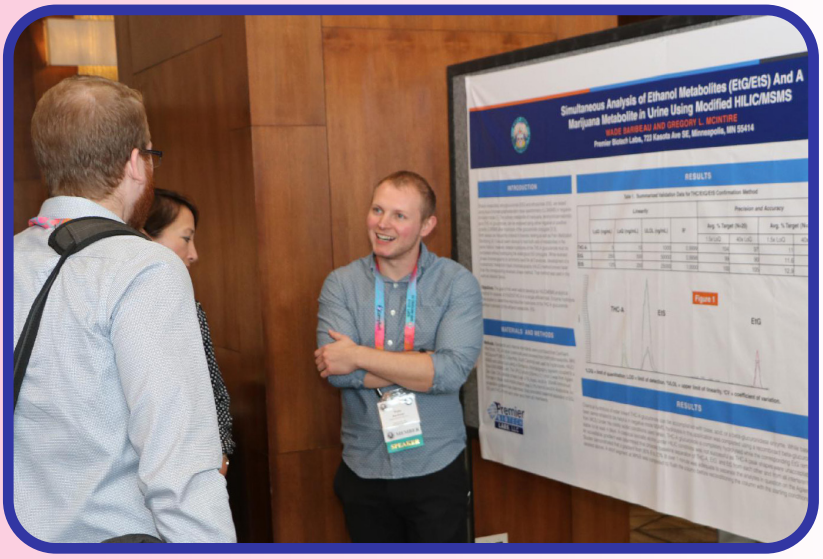
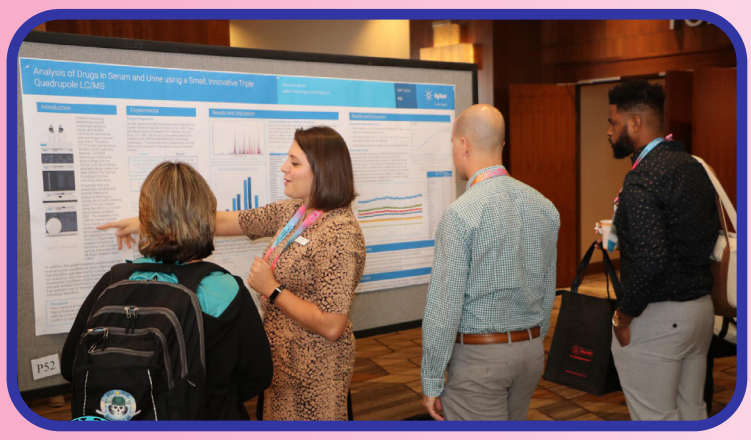
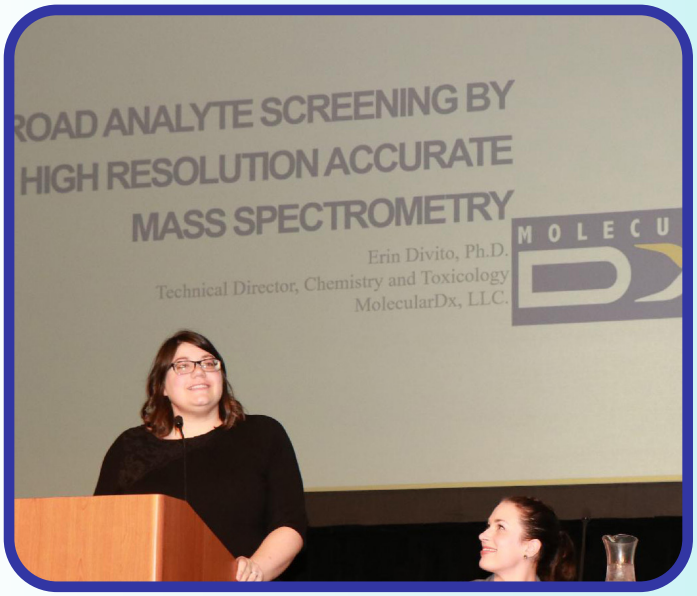
POSTER PRESENTATIONS





PLATFORM PRESENTATIONS



Emerging Drug: Flualprazolam

Donna Papsun[1], MS, D-ABFT-FT, Craig Triebold[2], F-ABC, D-ABFT-FT
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In recent years, there has been an increase of misuse related to designer benzodiazepines (DBZD), a subcategory of novel psychoactive substances (NPS). Benzodiazepines are commonly prescribed for their anxiolytic, muscle relaxant, sedative-hypnotic, and anticonvulsant properties, but due to their widespread availability and relatively low acute toxicity, there is a high potential for misuse and dependence. Therefore, in the era of analogs of commonly used substances emerging on the drug market as suitable alternatives, it is not unexpected that designer variants of benzodiazepines have become available and in demand. Compounds of this class may have either been repurposed from pharmaceutical research, chemically modified from prescribed benzodiazepines, or obtained from diversion of pharmaceuticals available in other countries.

Flualprazolam, a fluorinated analog of alprazolam, is an emerging designer benzodiazepine with increasing prevalence, which is an example of a modification to a prescribed benzodiazepine. It was first patented in the 1970s but never marketed, so it has been repurposed for recreational abuse from pharmaceutical research as well (1). Its chemical characteristics and structure are listed in Figure 1. Flualprazolam is a high potency triazolo-benzodiazepine with sedative effects similar to other benzodiazepines (2). It is marketed by internet companies for "research purposes" as an alternative to alprazolam and discussions on online forums suggest that flualprazolam lasts longer and is stronger than alprazolam, its non-fluorinated counterpart (3). Onset of action for flualprazolam is reported to be 10-30 min with a duration of action ranging from 6-14 h (4).

Flualprazolam was first detected on the European drug market in 2018, adding to a growing list of designer benzodiazepines being monitored by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) (5). More than half of the listed 23 substances of the designer benzodiazepine class have emerged since 2015, so overall this group of substances is increasing in popularity (6). The Drug Enforcement Agency (DEA) reported its first chemical identification within the United States in 2018; there have been an increasing number of reports from seized drugs between Q1 and Q2 in 2019 (7, 8). The Center for Forensic Science Research & Education reported its first detection of flualprazolam in a biological specimen in March 2018 through data-mining TOF screening data from authentic specimens, with 2 additional detections in June 2019 (9). In addition, flualprazolam was also detected in 1 of 13 postmortem bloods collected between 2016-2018 in NY after re-analysis with an updated designer benzodiazepine panel (10).

Sacramento County, California reported its first confirmation of flualprazolam in biological specimens in May 2018. Between May 2018 and August 2019, 124 cases of flualprazolam were confirmed by the laboratory in submitted blood specimens. Of the 124 positives, 123 cases were submitted from Driving Under the Influence of Drug (DUID) investigations. The concentrations ranged from 5-154 ng/mL, with average and median concentrations of 25 and 18 ng/mL, respectively; the reporting limit for the method was 5 ng/mL. The distribution of concentrations for these DUID cases is shown in Figure 2. The detection of flualprazolam has outpaced the detection of alprazolam in this county.

In addition to cases from California, NMS Labs in Horsham, Pennsylvania has confirmed 32 blood cases between June 2019 and early November 2019; testing capabilities were added in June 2019. The range of concentrations reported in these cases ranged from <2.0 – 68 ng/mL. See Table 2 for reported concentrations distributed between postmortem and DUID blood concentrations. Flualprazolam was confirmed in 13 different states; PA, SC, NV, LA, TX, OR, CA, IL, NY, OH, KS, MN, and IN. The highest reported concentration of 68 ng/mL flualprazolam was reported in a DUID case from TX. In one PA DUID case, a flualprazolam of 13 ng/mL was the only positive finding. In a second DUID case from PA, a 46 ng/mL of flualprazolam was detected in addition to a 0.029% blood alcohol concentration (BAC).

Flualprazolam is used as a central nervous system depressant, including its sedative/tranquilizer and muscle relaxant properties. Adverse effects of benzodiazepines can include sedation, reduced anxiety, loss of consciousness, impaired balance, incoordination, impaired cognitive abilities, muscle weakness, confusion, slurred speech, dizziness, and lethargic behavior. Misuse of designer benzodiazepines such as flualprazolam can produce cognitive and motor impairment after acute use, potentially contributing to traffic accidents and other poor driving behavior. Like pharmaceutical benzodiazepines,

Emerging Drug: Flualprazolam

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designer benzodiazepines can have severe toxicity when concomitantly used with other CNS depressant drugs, such as opioids and alcohol, which increases the risk of respiratory depression and death.

Although cross reactivity of flualprazolam has not been formally conducted, anecdotal experience leads the authors to suggest there is cross-reactivity of flualprazolam to commercially available immunoassays targeted for benzodiazepines. Many designer benzodiazepines cross-react with commercial immunoassay screens; cross-reactivity ranged from 79-107% for phenazepam, etizolam, pyrazolam, flubromazepam, diclazepam, and delorazepam (11). Therefore, it is suggested that an unconfirmed benzodiazepine immunoassay screen should be scrutinized for the possibility of designer benzodiazepines, and additional testing inclusive of flualprazolam may be applicable in certain cases. The GC/MS spectra of flualprazolam is provided in Figure 4.

Flualprazolam and many DBZD have never undergone the clinical testing that is required for licensed medicines and the increasing availability of these substances may pose serious health risks to drug users. Flualprazolam, when sold on the illicit drug market as the counterfeit form of another prescription drug, poses a significant threat to end users due to an increased risk of unintentional overdose and intoxication (4). Flualprazolam has been reported as the active ingredient in counterfeit alprazolam on a harm reduction website in the United States so these users may or may not know the true identity of the substance they are ingesting (12). As an emerging designer benzodiazepine, forensic toxicologists, seized

Characteristics and Chemical Structure	
Common Name	Flualprazolam
Chemical Name	8-Chloro-6-(2-fluorophenyl)-1methyl-4H-benzo[f][1,2,4]triazolo [4,3-a][1,4]diazepine
Synonyms	2'-Fluoro Alprazolam, ortho-Fluoro Alprazolam
Molecular Formula	$C_{17}H_{12}ClFN_4$
Molecular Weight	326.75
CAS Number	28910-91-0

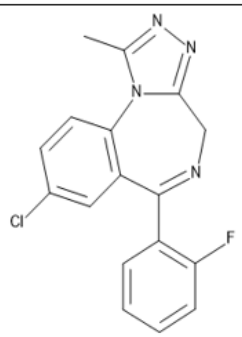
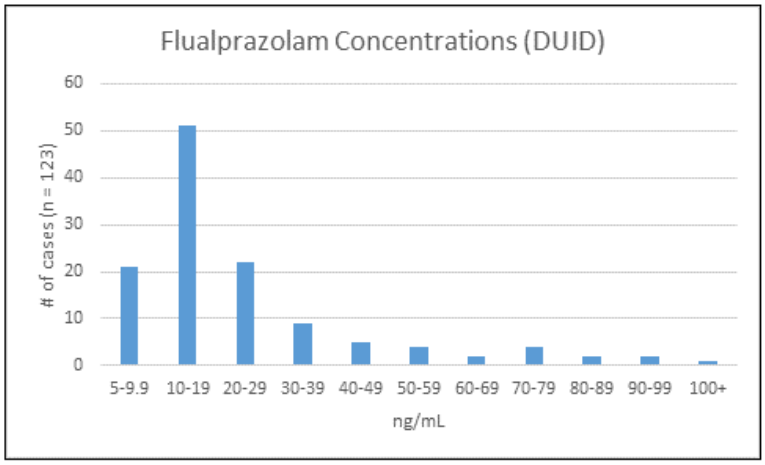


Figure 1: Table 1: Chemical characteristics and structure of flualprazolam



	Postmortem	DUID
Count	20*	12
Average (±SD)	13.2 ± 10.5	23.3 ± 18.7
Median	9.9	12
Range	<2.0-41	8.3-68

Figure 3: Postmortem and DUID flualprazolam concentrations in blood from NMS Labs casework. *Two samples were reported <2.0 ng/mL; reporting limit is 2 ng/mL.

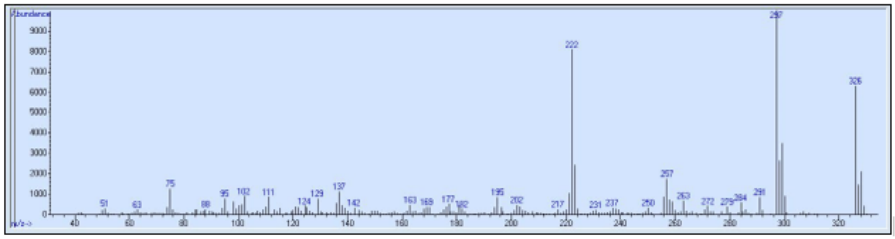


Figure 4: GC/MS spectrum of flualprazolam (provided by Craig Triebold, Sacramento, CA).

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[1]NMS Labs, Horsham, PA; [2]Sacramento County District Attorney Laboratory of Forensic Services, Sacramento, CA

drug and toxicology laboratories, law enforcement, hospital personnel, and public health officials should be aware of the increasing prevalence of flualprazolam and the threat it poses to public health and safety. Laboratories should consider adding flualprazolam to their scope of testing in order to truly understand the prevalence of this NPS in the United States.

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SOFT 2020 MEETING UPDATE
SAN DIEGO, CA • September 21–25, 2020

The 50th Annual Meeting of the Society of Forensic Toxicologists will be held September 21-25, 2020 in San Diego, California.

In 1970, the first informal meeting of what we now know as the Society of Forensic Toxicologists (SOFT) was held on Long Island, New York. We are extremely honored and privileged to serve as your hosts for the 50th anniversary of that meeting in San Diego in 2020. We have several things planned to make this a very special meeting, with the focus being on the history of our organization as well as how we plan to grow as an organization in the future. Both our planning committee and the newly formed History Committee have been working hard for several months now creating an exciting program with several new features that we're looking forward to sharing in the year to come. Please continue to check the SOFT website at **http://soft-tox.org/meeting** for updates to our meeting page, registration dates, abstract submission dates, hotel room block, sight-seeing, and local activities information.

The meeting hotel, scientific program, and the exhibit hall will be entirely under one roof at the Marriott Marquis San Diego Marina, **https://www.marriott.com/hotels/travel/sandt-marriott-marquis-san-diego-marina/** located at 333 W. Harbor Drive, San Diego, CA 92101. The conference room rate at the Marriott will be $245.00 per night plus taxes. This property is close (less than 5 miles) to San Diego International Airport (SAN), which can be reached non-stop from more than 60 cities in the U.S. and abroad. Estimated one-way taxi fare is $18 USD.

MINUTES
NOVEMBER 16, 1973

A combined meeting of the nomenclature and organization committees, appointed at the 4th annual Interim Toxicology Meeting was held in Nassau County, N.Y. on November 16, 1973. Present were Abraham Freireich, J. Speaker, J. Bidanset, L. Dal Cortivo, P. Schweda, D. Hoffman, N. Reading, J. Milzoff, and L. Bednarczyk.

Dal Cortivo reported that a number of names were proposed by the nomenclature committee. All the names were discussed. Dal Cortivo pointed out that "Society of Forensic Toxicologists" was the only name suggested by all members of the committee. He moved that this name be adopted. The motion was seconded by Schweda, and a unanimous "Yea" vote was recorded. The committee resolved that any discussion from the general membership would be taken under advisement.

2020 PLANNING COMMITTEE MEMBERS

2020 Meeting Hosts


Denice Teem


Dani Mata

Scientific Program Chairs
Bill Johnson
Laureen Marinetti

Workshop Chairs
Jennifer Limoges
Sue Pearring

Exhibitor Liaison
Liz Kiely

Food and Beverage
Ann Marie Gordon
Denice Teem
Delisa Downey
Carl Wolf

YFT Chair
Kevin Shanks

Volunteer Coordinators
Vanessa Meneses
Andre Sukta

Mobile Application
Rusty Lewis
Roxane M. Ritter
Sunday Saenz

Audio/Visual
Frank Wallace

Fun Run Coordinators
Eucen Fu
Phyllis Mallet

Social Event Coordinators
Alanna de Korompay
Jay Vargas
Javier Velasco

Opening Ceremony Coordinators
Delissa Downey
Bruce Goldberger

JAT Special Issue Editor
Luke Rodda

SOFT Staff
Executive Director
Beth Olson
Operations and Social Media Manager
CC Watson

SOFT 2020 MEETING UPDATE
SAN DIEGO, CA • September 21–25, 2020

San Diego is a great destination for families, so plan to bring them along and come early or stay after the meeting. The hotel is within walking distance to the famous Gaslamp Quater. There are also many other activities nearby such as the San Diego Zoo, San Diego Wild Animal Park, San Diego Padres baseball, SeaWorld, Legoland, Surfing, Beer/Wine Tasting, Hang Gliding, Balboa Park, Kayaking, Whale Watching, Casinos, Hotel Spa, Little Italy, Seaport Village, Coronado, Old Town, golf, and spectacular ocean beaches! Typical weather in September is expected to be 77/66 F.

SOFT has arranged for a special Wednesday evening event aboard the USS Midway **https://www.midway.org/about-us/midway-history/**.

This decommissioned aircraft carrier is now a museum located less than a mile walk from our meeting hotel. We will have dinner on the flight deck of this impressive ship, along with being able to explore the inside.

We invite you to join us at SOFT 2020 as we honor our past and look forward to the years to come. Please mark your calendars for September 21 – 25, 2020, start collaborating on those workshop and abstract proposals, and plan to join us as we celebrate 50 years of SOFT!

Your hosts,

Dani & Denice

2020 Meeting Hosts

Denice Teem

Dani Mata

2020 PLANNING COMMITTEE MEMBERS

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2020 Journal of Analytical Toxicology Special Issue

Submitted By: Luke N. Rodda, Ph.D.
Chief Forensic Toxicologist and Director, Forensic Laboratory Division, San Francisco OCME
Assistant Adjunct Professor, UCSF
Luke.Rodda@ucsf.edu

JAT

It is a great hono(u)r to be invited as Guest Editor for the Journal of Analytical Toxicology's Special issue, and I do promise to maintain the use of American English. This issue is particularly special being that 2020 will be the 50th anniversary of SOFT, so I thank our incoming SOFT President Dr. Suman Rana for entrusting me in this challenging yet rewarding role.

Both JAT and SOFT have grown from national origins, to truly international entities that forensic toxicologists rely on to disseminate and receive pivotal information in our industry. The ever-increasing impact factor and meeting attendance, respectively, are demonstrations of such.

Participation and sharing of your important research fuels further knowledge in our field, and provides key information for medicolegal casework in court deliberations. Manuscript completion and submission in peer-reviewed literature is often a challenging exercise. In acknowledgement, submission to this JAT Special Issue provides the opportunity to be recognized as the 2020 Experimental Design and Impact on Toxicology (EDIT) Award that all first authors of accepted manuscripts are eligible for.

The success of the Special Issues is reliant on you, the authors and reviewers. I therefore also invite you to serve as a reviewer, performing comprehensive and timely reviews of submitted manuscript in the peer-review process.

With this year being a 50th anniversary SOFT meeting, an increased amount of submissions are expected, thus I encourage all to submit punctually since the deadlines are not far away!

I look forward to your submissions and see you in San Diego!

DEADLINES!

January 31st, 2020:
Title and abstract submissions due to Special Editor
Luke.Rodda@ucsf.edu

February 14th, 2020:
Completed manuscripts due to JAT via Manuscript Central
https://mc.manuscriptcentral.com/jat

2020 CALL FOR WORKSHOP PROPOSALS

Workshop Proposals for SOFT 2020 are due by April 1, 2020. Look for the proposal submission form on the SOFT website in January 2020!

Please contact the Workshop Program Chairs, Sue Pearring and Jen Limoges, in advance if you have a workshop idea you're planning to submit. This includes ideas from SOFT committees! This helps avoid duplication of topics and aids in soliciting ideas if an area of interest has not yet been met.

We're happy to brainstorm with you if you're not quite sure – look forward to all of your SOFT 2020 Workshop Proposals.

2020 Workshop Chairs
Sue Pearring and Jen Limoges
sue.pearring@sfgov.org
jennifer.limoges@troopers.ny.gov

AAFS Annual Meeting News

Please double check your calendars and make arrangements to attend the 72nd Annual AAFS Meeting, February 17-22, 2020 at the Anaheim Convention Center in Anaheim, CA, USA. Dedicated to this year's theme of "Crossing Borders", we have another science-filled program in store for all attendees. Thanks again to the Toxicology Section officers, chairs, co-chairs, moderators, abstract reviewers, and volunteers for your tremendous efforts towards another successful meeting. Attendees can expect a wide array of quality workshops, posters and scientific sessions, breakfasts, and luncheons in 2020. The Toxicology Section will continue the traditional special sessions on Drugs and Driving, Postmortem Pediatric Toxicology and our joint session with the Pathology/Biology Section. This year's Annual Toxicology Lectureship features Research Psychologist Dr. Dary Fiorentino speaking on "The Effects of Low Blood Alcohol Concentrations on Human Performance and Behavior" Thursday, February 20, 2020.

• The Academy Cup returns on Wednesday, February 19, 2020 at 8:00 AM. Come early for what is always a fun and exciting start to the day and you can help your team on to victory in 2020.
• The annual Toxicology Section Luncheon will take place immediately prior to the Toxicology Section Business Meeting on Wednesday, February 19, 2020. Members choosing to attend the Toxicology Section Luncheon must register and pay for it during pre-registration as this luncheon is not included in the regular registration and on-site registration is unavailable.
• During our Toxicology Section Business Meeting we will acknowledge the following award winners: Christine Moore (Rolla N. Harger Award); Eric Lavins (Ray Abernethy Award), Natalie Desrosiers (Irving Sunshine Award), and Haley Mulder (June K. Jones Scholarship).
• Hotel accommodations are available now at the Anaheim Hilton via the AAFS website and the Advance Program is set for release on November 1, 2019.

Finally, we extend our gratitude to those generous vendors who have committed financial sponsorship towards the Toxicology Section: Shimadzu Scientific Instruments; Thomson Instrument Company; Lemos Toxicology Services, LLC; RTI International; Waters Corporation; UTAK Laboratories, Inc; and Lipomed, Inc. If your organization would like to offer support to the Toxicology Section, please contact Madeleine Swortwood, **mjs079@SHSU.EDU** for more details.

Thanks and see you all in Anaheim!

Tech-IN Tidbit: Better GC/MS Searching

Submitted By: Dan Baker, Franklin County Coroner's Office, Columbus, OH

Agilent's Chemstation DrugQuant software is a common GC/MS data analysis platform used in many forensic toxicology laboratories. Full-scan untargeted searching is a basic strategy of systematic toxicological analysis. Unfortunately, Chemstation DrugQuant software only permits up to three GC/MS libraries to be searched for the generation of automated library search summary reports. This is a major limitation for our laboratory which commonly uses several commercial and open-source libraries. However, the Chemstation DrugQuant software enables users to subset and append multiple libraries into a single library source allowing more effective and efficient automated library searches. By combining libraries to not exceed three total, the toxicologist can work-around the three library search software limitation.

As an example, some of the following common GC/MS libraries can be combined, so that not to exceed 3 total:

1. AAFS2012
2. SWGDRUG
3. Cayman
4. Designer Drugs (Rosner)
5. NIST

The above libraries 1-3 may be combined for improved automated searching.

1. Start by locating an open source library such as C:\Database\AAFS2012.L in Microsoft File Explorer, make a copy of the library file to C:\Database, and rename to something like MERGED2019.L.
2. Now open Chemstation DrugQuant Data Analysis and go into the Interactive Library Search view.
3. Select the dropdown Library and click Parametric Retrieval. Click Cancel.
4. Select the dropdown Library and click Subset Library.
5. Type the library/destination you would like to add to your existing MERGED2019.L (it already contains AAFS2012). i.e. C:/SWGDRUG.L and click Search.
6. Select Append To Library and click OK.
7. Select MERGED2019.L from the browse list (the library you want to

Tech-IN Tidbit: Better GC/MS Searching

Submitted By: Dan Baker, Franklin County Coroner's Office, Columbus, OH

add to) and click OK.

8. Once started, a counter in the bottom left of the window will show how many GC/MS spectra entries have been added. In this example, the message read "Finished adding 1660 entries to C:\Database\MERGED2019.L." Repeat steps 4-7 to add more GC/MS libraries to your merged library (just type the new additional library/destination to be added in step 5). Now you may set up your Library Search Parameters to search your newly created MERGED2019.L library, then next DesignerDrug.L, then next NIST.L. When you run the automated library search report, you will be searching now up to 5 libraries even with the 3 library Chemstation DrugQuant selection limit.

Keep records of what libraries and their release dates have been combined. You will want to periodically re-create your combined library to reflect new releases, maintaining the ability to detect a broad range of drugs and new psychoactive substances. Lastly, bear in mind, the subset/append utility is most useful for combining multiple smaller libraries, because there are file size limits that can be reached. Happy searching!

I would like to thank Dr. Graham Jones for originally sharing this knowledge on how to subset/append libraries a few years ago. We have found it of great benefit performing effective and efficient automated GC/MS general unknown searches.

ICAP 2020 Call for Presentations

The call for presentations for the 2020 IACP Drugs, Alcohol, and Impaired Driving (DAID) Conference is now open. The conference will be held August 6-8, 2020 in San Antonio, Texas.

The DAID Conference is the largest training conference for drug recognition experts and provides law enforcement, physicians, toxicologists, prosecutors, and other traffic safety professionals with a forum to share best practices for reducing drug- and alcohol-impaired driving.

Submitters are encouraged to submit innovative and engaging workshops on a variety of topics. IACP is looking for topics focusing on:

- Alcohol-impaired driving and alcohol in combination with drugs
- Drug-impaired driving issues, drug trends, and drug effects
- Law enforcement executives and impaired driving enforcement
- Prosecutor topics with an impaired driving focus
- Toxicology topics related to impaired driving
- Traffic safety and enforcement
- Submissions will be accepted through the online system now through December 31, 2019. Information regarding conference registration and hotel accommodations will be released Winter 2020. For more information about the DAID Conference, please visit: https://www.theiacp.org/DAIDconference.

SUBMIT A PROPSAL

From the Toxicology Literature

Submitted by: Kevin G. Shanks, M.S., D-ABFT-FT
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Clinical Toxicology (Philadelphia)

Volume 57

DOI: 10.1080/15563650.2019.1580371

Fatal Intoxication with New Synthetic Cannabinoids AMB-FUBINACA and EMB-FUBINACA

Adamowicz *et al*. describe the case of a 27 year old man who was found deceased in bed. He was last seen living about 6 hours prior. Pathological findings at autopsy included congestion of the internal organs, pulmonary edema, and left-sided pleural adhesions. Samples were drawn at autopsy for toxicological analyses. Postmortem blood was positive for lorazepam (6 ng/mL), haloperidol (11 ng/mL), lidocaine (29 ng/mL), and caffeine (5.8 mcg/mL). Urine was positive for lorazepam, haloperidol, lidocaine, caffeine, and the synthetic cannabinoids AMB-FUBINACA and EMB-FUBINACA. Both synthetic cannabinoids were also detected at varying concentrations in kidney, liver, intestine, lung, and brain, along with gastric contents. The authors conclude that this case report shows that synthetic cannabinoids can be undetectable in postmortem blood, even if the case was specifically an acute/fatal intoxication with the substances.

Forensic Toxicology

Volume 37

DOI: 10.1007/s11419-019-00476-z

Hyperreflexia Induced by XLR-11 Smoke Is Caused by the Pyrolytic Degradant

Hataoka *et al*. report a study in which mice were exposed to the synthetic cannabinoid, XLR-11, and locomotor activity and body temperature were monitored, along with intensity of catalepsy. Extracellular dopamine was measured in the regions of the nucleus accumbens and glutamate was measured in the hippocampus. Mice exposed to the XLR-11 smoke (which contained both XLR11 and the XLR-11 pyrolytic degradant) exhibited hyperreflexia early and was followed by hypothermia and catalepsy. Mice treated with the XLR-11 degradant only showed a hyperreflexic effect while mice treated with XLR-11 only did not show this effect. When treated with AM-251, the effects of the XLR-11 degradant were suppressed. Extracellular dopamine and glutamate showed no involvement in this reported hyperreflexia, but gabapentin did suppress the locomotor activity. The authors conclude that the XLR-11 pyrolytic degradant causes a hyperreflexic effect via mediation of the CB1 receptor and potentially by GABAergic activity.

Forensic Toxicology

Volume 37

DOI: 10.1007/s11419-019-00481-2

Norcarfentanil: Carfentanil Misuse or Remifentanil Treatment?

In this case report, Allibe *et al*. discuss the detection of norcarfentanil, a shared metabolite of carfentanil and remifentanil, in three human intoxication cases. Detection of carfentanil, remifentanil, and norcarfentanil was completed by liquid chromatography with triple quadrupole mass spectrometry after solid phase extraction. In case 1, a 41 year old man insufflated a white powder purported to be cocaine. After a few minutes he became unresponsive and exhibited myosis and bradypnea and was admitted to the hospital intensive care unit. Plasma and urine samples were drawn for toxicological analyses. The urine was positive for benzoylecgonine, ecgonine methyl ester, anhydroecgonine methyl ester, lidocaine, levamisole, midazolam, carfentanil, and norcarfentanil. Carfentanil and norcarfentanil were detected in the plasma sample. He was discharged in good health a few days later. In case 2, a 48 year old woman was found unconscious at home. She was admitted to the hospital intensive care unit and administered naloxone – which had no effect. Later she was intubated, ventilated, and treated via various medications. Plasma and urine samples were taken for toxicological analyses. The urine was positive for THC metabolite, lidocaine, buprenorphine, norbuprenorphine, naloxone, fentanyl, sufentanil, carfentanil, and norcarfentanil. Fentanyl, sufentanil, buprenorphine, norbuprenorphine, naloxone, carfentanil, and norcarfentanil were detected in the plasma sample. She was discharged after eight days. In case 3, a 57 year old man became dizzy and faint and suffered a heart attack while at a music festival. He was admitted to the hospital and died after six days in the intensive care unit. Plasma and urine samples were taken for toxicological analyses. The urine was positive for morphine, codeine, propofol, laudanosine, lidocaine, remifentanil, and norcarfentanil. Remifentanil and norcarfentanil were the only substances detected in the plasma samples. The authors conclude that norcarfentanil is a shared metabolite of both carfentanil and remifentanil.

Clinical Toxicology (Philadelphia)

Volume 57
DOI: 10.1080/15563650.2018.1534241

A Novel Synthetic Cannabinoid (CUMYL-4-Cyano-BINACA) Resulting in Hyperthermia, Rhabdomyolysis, and Renal Failure in a 29-Year-Old Patient: It's Not Meningitis

In this letter, El Zahran *et al*. report a case of a 29 year old man who was admitted to the hospital after a fall at his home. Witness reports stated he had been tired and physically weak for three days prior to the incident and had vomited. At admission, he was altered, combative, and hyperthermic (39°C). The man was given lorazepam for agitation and antibiotics for presumed sepsis and meningitis. Over the next three days, he was confused and renal failure progressed into day four of the admission. The man underwent dialysis on days five and six and his mental status improved significantly, at which time he admitted to smoking "synthetic marijuana" that he had purchased over the internet. He was discharged against medical advice on day ten with intact mental status. Serum from the hospital admission was analyzed by liquid chromatography-quadrupole time of flight mass spectrometry. The synthetic cannabinoid CUMYL-4-Cyano-BINACA was detected (35.5 ng/mL). Sepsis, meningitis, serotonin syndrome, and cyclobenzaprine overdose were ruled out as causative fac-

Submitted by: Kevin G. Shanks, M.S., D-ABFT-FT
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tors by various other analyses. The authors conclude that intoxication with CUMYL-4-Cyano-BINACA can result in acute kidney injury, altered mental status, rhabdomyolysis, and hyperthermia, which can mimic other neurological conditions.

Forensic Science International

Volume 304

DOI: 10.1016/j.forsciint.2019.109915

A Case Report on Potential Postmortem Redistribution of Furanyl Fentanyl and 4-ANPP

Freni *et al*. report the potential postmortem redistribution of furanyl fentanyl and 4-ANPP via the case of a 53 year old man who was found unresponsive at him while sitting at his desk with a needle still inserted in his hand. The individual was in full rigor mortis and declared deceased at the scene. Pathological findings at autopsy included recent puncture wounds on the hands, needle marks on the arms, petechiae on the lower limbs, multi-visceral congestion, pulmonary edema, and cerebral edema. Heart blood, femoral blood, urine, gastric contents, bile, and cerebrospinal fluid were collected at autopsy for toxicology testing. Analyses revealed positive results for furanylfentanyl and 4-ANPP in each of the specimen matrices. Cardiac blood was positive for furanylfentanyl (11.8±0.7 ng/mL) and 4-ANPP (93.5±7.6 ng/mL), while femoral blood was positive for furanylfentanyl (2.7±0.1 ng/mL) and 4-ANPP (50.4±2.9 ng/mL). The authors demonstrate in this case report that both furanylfentanyl and 4-ANPP can undergo extensive postmortem redistribution.

Journal of Analytical Toxicology

Volume 43

DOI: 10.1093/jat/bky093

Detection of Fentanyl Analogs and Synthetic Opioids in Real Hair Samples

Salomone *et al*. describe a rapid analytical method using liquid chromatography with triple quadrupole mass spectrometry for the detection of thirteen synthetic opioids, fentanyl analogs, and metabolites in hair samples. Sample preparation included washes with dichloromethane and methanol, drying under nitrogen gas flow, ball mill grinding, addition of internal standards, addition of methanol, and incubation at 55°C for fifteen hours. Instrumental analysis was performed on a Shimadzu LC-30A Series system liquid chromatograph coupled to a Sciex 5500 triple quadrupole mass spectrometer. During method validation, selectivity, specificity, linearity (including limits of detection and quantitation), precision and accuracy, carryover, recovery, and matrix effects were assessed. The method was applied to authentic hair specimens (taken from people aged 18-40 who were attending a party in New York City). The study honed its focus on individuals who reported any past-year non-medical opioid or heroin use. A total of thirty four samples were analyzed; each hair sample was analyzed in full length. Seventeen of the samples tested positive for at least one opioid analyte. Results included oxycodone (n=9, 13-780 pg/mg), tramadol (n=8, 2.0-3700 pg/mg), hydrocodone (n=4, 13-71 pg/mg), fentanyl (n=2, 3-6 pg/mg), furanylfentanyl (n=1, 44 pg/mg), and 4-ANPP (n=2, 1-2 pg/mg). Any positive quantitative results refer to the average value across the full length of hair.

Share your SOFT Pictures & Messages

SHARE YOUR SOFT PHOTOS!

Did you take photos at this year's SOFT meeting in San Antonio? Have you taken pictures at past SOFT meetings? If yes, we would be delighted if you could share them with us! Use the link below to upload your photos.

HTTPS://BIT.LY/2NNOX6Y

SHARE YOUR MESSAGE!

IN HONOR OF SOFT'S 50TH ANNIVERSARY WE WILL CREATE AN E-PUBLICATION THAT WILL INCLUDE MESSAGES FROM SOFT MEMBERSHIP. YOUR MESSAGE CAN BE FUNNY, INSPIRATIONAL, WISTFUL, HOPEFUL, CLEVER, ACTUALLY ANYTHING AS LONG AS IT IS PROFESSIONALLY APPROPRIATE.

SHARE YOUR MESSAGE WITH THIS LINK:
HTTPS://FORM.JOTFORM.COM/91926562962165

TOXTALK

TOXTALK® is the official publication of the Society of Forensic Toxicologists and is published quarterly.

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For advertsing opportunites please email Beth Olson at beth@soft-tox.org

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February 1 for March Issue
May 1 for June Issue
August 1 for September Issue
November 1 for December Issue

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FUTURE SOFT MEETINGS

2020
Marriott Marquis San Diego Marina, San Diego, CA
September 21–25, 2020
Denice Teem and Dani Mata

2021
Gaylord Opryland, Nashville, TN
September 26–October 1, 2021
Jennifer Colby and Erin Karschner

2022
Huntington Convention Center, Cleveland, OH
October 30-November 4, 2022
Doug Rohde and Michele Merves Crosby

2023
Gaylord Rockies, Denver, CO
October 29–November 3, 2023
TBD

SOFT 2019 COMMITTEE CHAIRS

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Designer Drugs	Dani Mata, D-ABFT-FT
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Drug Facilitated Crimes	Laureen Marinetti, Ph.D., M.S., F-ABFT
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