Society of Forensic Toxicologists, Inc.

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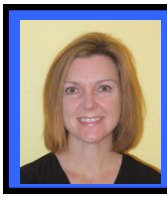

PRESIDENT'S MESSAGE

Submitted by **Jennifer Limoges, M.S., DABC**

The annual meeting in Dallas was another hugely successful meeting, filled with exceptional science and outstanding social opportunities. Thank you so much Erin Spargo and Chris Heartsill and your fantastic team for hosting us all in the Big D!

As I reported during the annual Business Meeting, I am so proud of the important things that have been accomplished this year by your fellow members. Our Committees and Liaisons have done an outstanding job. Some of the highlights include the Annual Meeting, the JAT Continuing Education Credits, and the numerous high quality Regional Workshops.

On the national scene, there continues to be a tremendous amount of focus on forensic science, and SOFT is well positioned to be influential in the future of our field. We have members on all the major groups – the National Commission on Forensic Science, the Academy Standards Board and its Toxicology Consensus Body, and all levels of the NIST OSAC – from the FSSB to the Chemistry SAC to the Tox Subcommittee. These groups will impact how our work is done, who can do our work, and how our important work will get the necessary resources. SOFT is here as your resource to keep you aware of the important issues facing our field. I strongly encourage you to not only stay current, but to actively participate in the process.

We've also had some important organizational changes this year. We hired the first SOFT Executive Director, Beth Olson. I know many of you had the pleasure of meeting her in Dallas. Beth will be managing the day to day operations of the organization, improving our financial structure and segregation of duties, and providing business stability through

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PRESIDENT'S MESSAGE *(CONTINUED)*

changing leaders. She will be supporting the dedicated volunteers that make SOFT so successful, and she will be helping the Board identify long term goals that continue to find new ways to meet the needs of our members.

We have also relocated our SOFT office. Most of you have never had the pleasure of seeing "SOFT Central", but it was a small room (~10x10) in the basement of an office building filled with file cabinets, boxes, and folding tables. We will now have a "real" office suite on the second floor of the same building, so only the Suite Number will change in our address. The new office space provides an office for the Executive Director and the Administrative Assistant, a conference room for small meetings, and a storage area.

Then comes our final big task of the year… regretfully accepting Bonnie Fulmer's retirement. Enough cannot be said about how special Bonnie is to SOFT. She is truly the backbone of the organization. I cannot think of a more dedicated or loyal person to have in our corner. She has always had the best interest of SOFT at the core of everything she does for us. We knew this day would eventually come, but it is so hard to imagine calling the office and not hearing her voice, or going to the annual meeting and not seeing her welcoming smile at the registration desk! We are so grateful for her hard work over all these years with SOFT. She will be truly missed, but she will always be a part of the SOFT family. We wish her all the best for a long, healthy, and happy retirement.

So now I get to introduce you to our new Administrative Assistant, CC Watson! CC will be joining SOFT on December 12th. She has excellent experience in accounts payable/receivable, customer service, event planning, marketing/social media, and office management. Please join me in welcoming CC to the team.

As I transition into the Past President role, I leave you all in great hands. Thank you to my fellow Board members, for not only their hard work this year, but for their support and comradery. We've had some significant challenges this year and I am so impressed with the professionalism, insight, and intelligence of this team. Thank you also to past Board members for their mentoring and guidance over the years. And thank you to all of you for allowing me the privilege of serving as your President. It is truly the highlight of my career and something I will always be immensely proud of.

Have a wonderful holiday season!

AAFS Annual Meeting in New Orleans

February 13-17, 2017

With just a few months separating us from the 69th Annual Scientific Meeting in beautiful New Orleans, LA, otherwise known as "The Big Easy", preparations are underway to deliver an educational and cutting-edge program in accordance with this year's theme: Our Future Reflects Our Past: The Evolution of Forensic Science.

New Orleans is one of the world's most fascinating cities – it's home to a truly unique melting pot of culture, food and music. Come down and experience New Orleans, one of America's most culturally and historically-rich destinations. The official New Orleans tourism guide at NewOrleansOnline.com is loaded with information on things to do, where to eat, great places to stay and more.

The annual Toxicology Section Luncheon will take place immediately prior to the Toxicology Section Business Meeting on Wednesday, February 15, 2017. Members who wish to attend the Toxicology Section Luncheon must register and pay for it during pre-registration, as this luncheon is not included in the regular meeting registration and participants cannot be added on-site.

During our Toxicology Section Business Meeting, we will honor the following award winners: John F. Wyman, Ph.D. (Rolla N. Harger Award); Laura J. Liddicoat, B.S. (Ray Abernethy Award); Dayong Lee, Ph.D. (Irving Sunshine Award); and Kayla N. Ellefsen, Ph.D., and Matthew N. Newmeyer, B.S. (June K. Jones Scholarship). Unfortunately, this year we

AAFS Annual Meeting in New Orleans *(CONTINUED)*

received no nominations for the Alexander O. Gettler Award.

Our formal scientific program, which will start on Wednesday evening with the Poster Session, will include traditional sessions such as Drugs and Driving and Postmortem Pediatric Toxicology, and will also feature a session on Novel Psychoactive Substances (NPS) and a joint session with the Pathology/Biology Section of the Academy.

On Thursday morning, the Toxicology Annual Lecture will be delivered by Lori Arviso Alvond, M.D., Chief, Surgical Services, Banner Page Hospital in Page, AZ. She will speak on The Healing Properties of Navajo Ceremonies in her capacity as Medicine Woman and Native American Medical Doctor.

Finally, we cannot emphasize how grateful we remain to all of you who volunteered to review abstracts and to moderate sessions, as well as to our generous vendors to date who have committed financial sponsorship towards the Toxicology Section Program: Aegis Sciences Corporation, Agilent Technologies, Inc, Immunalysis Corporation, Lipomed, Inc, NMS Labs, RTI International, Center for Forensic Science Research, and UTAK Laboratories, Inc. Ongoing sponsorship opportunities continue to exist and we urge you to refer your vendors and suppliers to either Section Program Chair, Nikolas Lemos (Nikolas.Lemos@ucsf.edu), or Co-Chair, William (Bill) R. Johnson (William.Johnson@slh.wisc.edu) if they are interested in being a part of such an educational event attended by thousands of delegates from dozens of countries.

Thank you and see you all in The Big Easy!

Nikolas P. Lemos, Ph.D., FRSC, F-ABFT

New Executive Director: Beth Olson

By the time you read this, I will have been in my new role as Executive Director of SOFT for nearly three months. I had a crash course in SOFT by attending the Dallas meeting after just over three weeks on the job! It was such a remarkable introduction to my new role, and so exciting to see the great work that Bonnie and all of the SOFT volunteers do all year come to fruition.

As a career nonprofit professional, SOFT's commitment to volunteerism really strikes a chord with me. I love the energy and passion that volunteers bring to an organization, and SOFT is a shining example of what a committed group of people can do when they put their hearts and minds together, roll up their sleeves, and get to work.

My primary objective as Executive Director is to enhance the SOFT experience for the members, volunteers and Board. I look forward to getting to know all of you, and I'm very interested in hearing your feedback about what SOFT is doing successfully, as well as any ideas for improvement. Please feel free to reach out to me at any time. It is my goal to help SOFT continue to be the warm, welcoming family that it has always been, while utilizing new processes, procedures and technology to better meet the needs of our members.

I am also pleased to announce the hiring of CC Watson as SOFT's Administrative Assistant. CC is currently in training with our current Administrative Assistant, Bonnie Fulmer, who is retiring at the end of the year. Please welcome CC to the SOFT family!

Of course, I would be remiss if I didn't offer a grateful farewell to Bonnie. Bonnie welcomed me with open arms from my first day on the job, and has tirelessly worked to ensure that CC and I are prepared to take over the daily operation of SOFT. She happily answered my many, many questions and her infectious energy makes coming to work every day a real pleasure. Her love for SOFT is apparent in everything she does and I know that she will miss us almost as much as we will miss her!

Thank you to everyone who has already made me feel so welcome in first few months at SOFT. I look forward to getting to know more of you, and continuing the great work that SOFT has been doing for so many years.

2017 SOFT-TIAFT Joint Annual Meeting

The TIAFT flag was accepted by Ruth Winecker and Marc LeBeau during the TIAFT annual meeting in Brisbane, Australia in September 2016 and the SOFT flag was accepted by Dan Anderson and Ruth Winecker during the SOFT annual meeting in Dallas, Texas in October 2016 thus officially transferring the duties of hosting the next annual meeting for both organizations.

Please join your hosts, Dan Anderson and Ruth Winecker for the 5th Joint Meeting of the Society of Forensic Toxicologists (SOFT) and The International Association of Forensic Toxicologists (TIAFT) to be held September 9-14, 2017 in Boca Raton, Florida, US. Boca Raton is a beautiful coastal city located about 30 miles south of Palm Beach, 20 miles north of Fort Lauderdale and about 50 miles north of Miami. Florida is considered "The Sunshine State" and the state's gorgeous climate makes it a spectacularly warm and sunny place to visit all year around with September being the last true summer month in Florida.

The meeting venue will be held at the very exclusive, Waldorf Astoria Boca Raton Resort & Club (http://www.bocaresort.com). This luxurious resort is situated on 356 acres with amenities that include an ultimate spa experience, golf, tennis, surfing, boating, and private beach access. The room rates have been guaranteed at $199 (plus tax) that includes the resort fee and complimentary in-room WiFi. Many of the charming and sophisticated guest rooms come with a view of the Atlantic Ocean, Intercoastal Waterway, or the marina.

The scientific program will be chaired by Dr. Robert Kronstrand and Dr. Robert Johnson, and the workshops chaired by Dr. Frank Peters and Dr. Diane Boland. Social events include a welcoming reception with our exhibitors on Monday, a Beach Party on the Beach Club's pool deck on Tuesday, a yacht dinner cruise on the Intercoastal Waterway on Wednesday, and the Thursday night Presidents Dinner and Closing Ceremony.

Registration will be offered in the Spring of 2017 through the SOFT Website (http://www.soft-tox.org). Please mark your calendars and join us for the Joint Annual Meeting of SOFT-TIAFT 2017 and make this a wonderful experience in Boca Raton, FL.

IMPORTANT DATES:

Workshop Proposals due: March 15, 2017

Abstracts Due: April 15, 2017

SOFT/TIAFT 2017

Annual Meeting in Boca Raton, FL—September 9-14, 2017

Call for Abstracts, Moderators and Reviewers

Abstract Submission Deadline is April 15, 2017

The SOFT/TIAFT 2017 Scientific Program Committee is requesting abstracts on all topics related to forensic toxicology. The Committee will select appropriate abstracts to be presented as either a 10-minute platform presentation or poster presentation. Please refer to the SOFT website for additional information on abstract requirements and submission (http://www.soft-tox.org/scientific-sessions).

In addition, the Leo Dal Cortivo Memorial Fund is allowing the Young Forensic Toxicologists Committee to present two awards to young forensic toxicologists at the SOFT/TIAFT Meeting. The best platform presentation and the best poster presentation will be chosen from among the eligible entries, and the presenting author will be awarded a cash stipend of $1,000 in addition to a free registration for a future SOFT meeting. The judging takes place from October 19-21, 2016. For eligibility requirements and instructions on how to apply, go to the Young Forensic Toxicologists tab on the SOFT website (www.soft-tox.org/yft).

The TIAFT Young Scientist Committee will present three awards to young forensic toxicologists at the SOFT/TIAFT Meeting. The best oral presentation, the best poster presentation and the best published article of that year will be chosen among the eligible TIAFT Young Scientists. The requirements and instructions on how to apply are described on the TIAFT website: http://www.tiaft.org/young-scientists-awards.html.

If you would like to serve as an abstract reviewer or moderate a session at the meeting, please contact the Scientific Program Committee Chairs at ScientificProgram@soft-tox.org. The SOFT/TIAFT 2017 Scientific Program Committee Chairs are Dr. Robert Johnson and Dr. Robert Kronstrand.

Call for Workshop Proposals

Proposal Submission Deadline is March 15, 2017

The submission form is located on the SOFT website under the “Annual Meetings” tab. Completed forms should be emailed to the 2017 Workshop Coordinators, Frank Peters at Frank.Peters@med.uni-jena.de and Diane Boland at dboland@miamidade.gov. Please inform Frank and Diane of your intent to submit a workshop proposal prior to submission so they can follow up on your progress. Please feel free to contact us with any questions you may have regarding the workshops and the submission process.

Thank you!

Evolution of SOFT Office

A new phase of the SOFT office is beginning to take shape with the leasing of a new multi-office suite in Mesa, AZ, to accommodate the new Executive Director and new Administrative Assistant. The Board anticipates that the new SOFT office will become a central hub for meetings and perhaps become available as a training venue.

In 2006, SOFT President Tim Rohrig and the Board of Directors made the huge decision (at the time) to open a SOFT administrative office in Mesa, staffed with one part-time employee. Before 2006, all administrative duties of the organization were largely handled by contract employees out of home offices.

Since 2006, SOFT has grown from 800 to 1,375 members. Along with the growing membership numbers, many new programs have been added, and the annual meeting attendance has grown to more than 1,000 attendees.

Along with the incredible steady growth of the SOFT organization, also came changes to sustain and manage its success. SOFT recently added a new Executive Director, Beth Olson, and a new Administrative Assistant, CC Watson. CC will replace the retiring Bonnie Fulmer, who is looking forward to a more leisurely lifestyle!

Bonnie has been the sole employee in the Mesa SOFT office since its 2006 inception and treasures the friendships and memories made from working in this position for the last ten years. She would like to express her love and appreciation to so many in the SOFT membership that she has had the privilege to work with in different capacities, including the spouses "significant others" (SO-SOFT) who routinely volunteer their time at the annual meetings and work hard at the registration desk at annual meetings.

Please welcome the new incoming staff and appreciate the incredible history of this amazing organization.

ABFT and ANAB Form Strategic Alliance

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

The American Board of Forensic Toxicology (ABFT) and the ANSI-ASQ National Accreditation Board (ANAB) have formed a strategic alliance whereby ANAB will administer the ABFT accreditation program on behalf of the ABFT.

While the ABFT laboratory accreditation program will be unchanged, all forensic toxicology laboratories accredited by the ABFT or seeking ABFT accreditation will now have an avenue to become accredited to ANAB's forensic testing program based on ISO/IEC 17025, the international standard for testing laboratories. Each laboratory accredited by ANAB and ASCLD/LAB will have the opportunity to add the ABFT Laboratory Accreditation Standard to its scope of accreditation.

Under the ABFT-ANAB alliance, ABFT laboratory inspectors will continue conduct inspections for ABFT's current laboratory accreditation program. ANAB will provide appropriate training to ABFT laboratory inspectors and ANAB-ASCLD/LAB toxicology assessors to conduct ANAB assessments that include the ABFT Laboratory Accreditation Standard.

The ABFT has had an accreditation program for forensic toxicology laboratories involved in postmortem toxicology and human performance testing for 19 years. It currently accredits 40 laboratories. ANAB-ASCLD/LAB has been accrediting forensic toxicology laboratories for more than 30 years. The ABFT-ANAB alliance will combine the resources of both programs to provide the highest quality accreditation services available in postmortem and human performance forensic toxicology.

ANSI-ASQ National Accreditation Board
ANAB

For more information,
contact bruce-goldberger@ufl.edu.

American Board of
ABFT
Forensic Toxicology™

2016 SOFT Dallas Meeting Wrap-up

Submitted by **Erin Spargo and Chris Heartsill,** Meeting Hosts

Wow – was that a great meeting or what?! There were workshops and scientific sessions with new and informative science, as well as a fun-filled social agenda that included a night exploring the Perot museum, a welcome reception complete with a mechanical bull, and hours of dancing at the President's Reception! A big thank you to our planning committee and all of the vendors – the meeting wouldn't have been such a huge success without them.

We would like to take one final opportunity to acknowledge our hard working committee members:

Meeting Treasurer
Laurel Farrell

Scientific Chairs
Sabra Botch-Jones, Karen Scott

Workshop Coordinators
Sue Howe, Liz Kiely

Vendor Liaison
Jarrad Wagner

Food and Beverage Coordinators
Ann Marie Gordon, Denice Teem

Audio Visual Coordinator
Frank Wallace

Young Forensic Toxicologists Programs
Sarah Urfer

Fun Run
Aria McCall

Silent Auction Chairs
Delisa Downey, Robert Johnson

Volunteer Chairs
Dani Mata, Samantha Tolliver

Website
Russell Lewis

We also want to include a very special thank you to Bonnie Fulmer for all of her hard work on what has turned out to be her final SOFT meeting as the organization's administrative assistant. She works tirelessly on these meetings to make sure they are successful and we are truly appreciative of all the help and guidance she provided over the years of planning.

In closing, we hope your vests, socks and blankets keep you warm this winter and we look forward to seeing you in sunny Boca Raton in September!

Erin and Chris

ERA/YSMA News

Submitted by **Erin Spargo, Ph.D.,** Awards Chair

Congratulations once again to our Educational Research Award and Young Scientist Meeting Award winners – Meaghan Drumm, Lorna Nisbet, Madeleine Swortwood, and Erin Strickland.

Awardees are shown below receiving their plaques from President Jennifer Limoges at the SOFT 2016 business meeting held in Dallas:

Meaghan Drumm – ERA winner

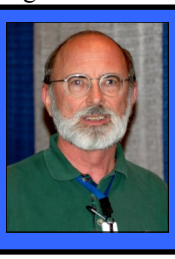
Lorna Nisbet – ERA winner

Madeleine Swortwood – ERA winner

With the 2016 meeting having come and gone, it's time to look forward to submitting applications for the meeting in Boca Raton next year. These competitive awards are an excellent way for students and bench level scientists to be able to attend the annual meeting where they can share their research and network with others in the field. I encourage you to look around your organization for candidates and to urge those that are eligible to apply.

As a reminder, the 2017 due date for applications is Friday April 7th. Applications and instructions for the ERA and YSMA can be found in the Features/Awards portion of the SOFT website. Please note that if the applicant is not a SOFT member, the mentor/supervisor must be a full or charter member. Please contact the Awards Chair, Erin Spargo, at erin.spargo@dallascounty.org or 214-920-5973 with any questions about the application process.

Erin Strickland – YSMA winner



CASE NOTES

Send interesting *"Case Notes"* to Section Editor

Matthew Barnhill, Ph.D., F-ABFT

mbarnhilljr@gmail.com

Postmortem Cases Involving Fentanyl Derivatives and U-47700

Submitted by **Sara A. Short, D-ABFT-FT, Janet Schultz, Ph.D., Emily Lawler, Kaylon Wells**

Oregon State Police Forensic Laboratory, Clackamas, OR

Email: sara.short@state.or.us

Introduction

Effective August 22, 2016, the Oregon Board of Pharmacy ruled to prohibit the sale and possession of synthetic opioids and fentanyl derivatives by categorizing these drugs as Schedule I in Oregon. This decision was made after the drug chemistry section at the Oregon State Police (OSP) Forensic Labs reported the rise of fentanyl derivatives in their casework. At the same time, the Toxicology section was observing a number of fentanyl derivatives in overdose deaths.

As part of OSP Toxicology's analytical testing scheme, all postmortem blood samples are first screened by ELISA (Immunalysis). As early as 2014, we observed fentanyl assays that were positive for cases in which fentanyl was not confirmed. After communication with Immunalysis, we discovered that the fentanyl assay demonstrates cross-reactivity with most fentanyl derivatives, including furanyl fentanyl, butyryl fentanyl, acetyl fentanyl, and valeryl fentanyl.

Since 2014, our laboratory has analyzed twelve postmortem cases involving fentanyl derivatives or other novel synthetic opioids, including U-47700. Our laboratory determined that a quantitative method for these drugs was critical to include in our postmortem toxicological analysis.

To address this need, a quantitative method was developed and validated for 14 synthetic opioids in blood by LC/MS/MS. (see below)

Synthetic Opioid	Internal Standard
3-methyl fentanyl	Fentanyl-d_5
4-ANPP	
4-methoxy-butyryl fentanyl	
Acetyl fentanyl	
Beta-hydroxythiofentanyl	
Butyryl fentanyl	
Fentanyl	
Furanyl fentanyl	
Isobutyryl fentanyl	
MT-45	
Para-fluorobutyryl fentanyl	
Para-fluorofentanyl	
Valeryl fentanyl	
U-47700	U-47700-d_6

Reference standards were purchased from Cayman Chemical. The calibrator concentrations are prepared at 1, 2.5, 5, 10, 40, 80, and 100 ng/mL for all synthetic opioids except for U-47700. Due to the higher concentrations that were observed in casework, the calibration range for U-47700 was extended to 200 ng/mL. Quality control samples are prepared at 4, 25, and 85 ng/mL.

Each blood sample aliquot (250 µL) is spiked with 25 µL of a deuterated internal standard working solution (0.5 µg/mL) containing both fentanyl-d_5 and U-47700-d_6. Case samples, calibrators, and controls are extracted by solid phase extraction.

The extracts are analyzed on a Sciex 3200 Q-Trap coupled with an Agilent 1290 liquid chromatograph.

Results and Discussion

After a successful validation, ten blood samples from cases collected since 2015 were extracted and analyzed. These cases were submitted from multiple counties throughout Oregon. Table 1 details the results of those tests.

Other novel drugs that were confirmed in these cases include: etizolam, N-acetyl-fluoroamphet-

Postmortem Cases Involving Fentanyl Derivatives and U-47700 *(CONTINUED)*

Table 1: Summary of cases containing synthetic opioids

Case no.	Sex	Age	Site of blood draw	Synthetic opioid(s)	ng/mL
1	M	31	femoral	acetyl fentanyl	100 (NMS)
2	M	24	femoral	butyryl fentanyl	20 (NMS)
3	M	22	femoral	para-fluorobutyryl fentanyl	46.3
4	M	28	subclavian	U-47700	64.9
				fentanyl	151
				butyryl fentanyl	26
				4-ANPP	5.5
5	M	22	femoral	furanyl fentanyl	1.5
				4-ANPP	3.2
6	M	21	femoral	U-47700	>400
7	M	48	unknown	furanyl fentanyl	3.4
				4-ANPP	5.8
8	M	29	cardiac	U-47700	< 1.0
9	M	53	cardiac	furanyl fentanyl	45.1
				4-ANPP	18
10	M	20	femoral	U-47700	359
11	F	46	femoral	furanyl fentanyl	1.3
				4-ANPP	5.7
12	M	31	cardiac	U-47700	263

amine, flubromazepam, flubromazolam, EAPB, and 3-methoxy-PCP.

Cases 1 and 2 are the earliest deaths from 2014 and 2015, respectively. At that time, these cases were sent to NMS Labs in Willow Grove, Pennsylvania for quantitation and the results are included in Table 1.

During our analysis of these cases, we were expecting that the concentrations of fentanyl derivatives would be similar to what we typically observe with fentanyl; however, the concentrations of U-47700 in postmortem blood were quite high. Although this was an unexpected observation, these values are consistent with what has been reported in recent publications.[1,2]

Conclusion

From this collection of data from postmortem blood samples, fentanyl derivatives and/or U-47700 have contributed to deaths in Oregon since 2014. Since there is limited published literature on these drugs, it will be beneficial for the toxicology community to collect and share data so that we may begin to understand the toxic and lethal concentrations.

References

1. Matthew J. Jones, Bradley S. Hernandez, Gregory C. Janis & Samuel J. Stellpflug (2016): A case of U-47700 overdose with laboratory confirmation and metabolite identification. *Clinical Toxicology*. Published online 23 Aug 2016.

2. Amanda L. A. Mohr, Melissa Friscia, Donna Papsun, Sherri L. Kacinko, David Buzby, and Barry K. Logan (2016): Analysis of Novel Synthetic Opioids U-47700, U-50488 and Furanyl Fentanyl by LC-MS/MS in Postmortem Casework. *Journal of Analytical Toxicology*. Published online 01 Sep 2016.

DUID Case with an Unusual High Concentration of Fentanyl

Submitted by **John Musselman and Anil Solanky**

Phoenix PD Crime Laboratory

Last year the Drug Enforcement Administration (DEA) issued a nationwide alert in response to a surge in overdose deaths from heroin laced with the narcotic drug fentanyl. Recently fentanyl has been in the news with many overdose deaths resulting from fentanyl analogues being sold as heroin.

In the beginning of this year, late at night, Phoenix Police responded to emergency radio traffic call regarding a vehicle, still running, laying on its driver's side in a dry concrete irrigation canal. When Phoenix Police officers arrived at the scene, the driver was found in the driver's seat of a 4 door Toyota Corolla unconscious, unresponsive, pale, cyanotic, with agonal respirations that were strained/ snoring and pin point pupils unresponsive to light. He had no signs of head injuries. There were also 2 small children in the back seat who were not injured. Witnesses advised police that the vehicle was seen traveling northbound, coasted through the southbound lanes of traffic and drove off the road into the canal.

Firefighters lifted him out of the vehicle by his arms and legs and placed him on a stretcher. Paramedics at the scene evaluated the driver, who had symptoms consistent with a narcotic overdose, and administered 2 milligrams of Narcan intravenously and 2 milligrams nasally. Within 30 seconds of the intravenous Narcan administration the driver began to regain consciousness and was able to speak with them. He was transported to the emergency room where he was read his Miranda rights and advised that he was under arrest for impaired driving. The nurse conducted a medical blood draw and collected two grey top blood tubes. During the police interview, when asked if he was on any medication, the driver stated that he was taking Suboxone, since he was addicted to pain killers and last took it 2 days ago. When the mother came to the hospital to take custody of the children she informed the officer that earlier that day, in the morning, she had to pick him up from the Arizona Department of Public Safety who had arrested him for impaired driving.

In addition, a small green plastic bag containing white powder believed to be cocaine or heroin was found in the back of the police vehicle after transporting the driver from the hospital to the precinct. This was submitted to the lab and was identified as fentanyl.

The following were the results of the toxicological analysis of the blood sample:

- EMIT Screen positive for benzodiazepines and cannabinoids

- Full scan GC/MS screen positive for alprazolam and fentanyl

- LCQQQ screen positive for fentanyl, norfentanyl and naloxone

- GC/MS confirmation:
  - Alprazolam 100 ng/mL
  - Carboxy-THC 39 ng/mL

- LCQQQ confirmation:
  - Fentanyl 19 ng/mL
  - Norfentanyl 2.4 ng/mL
  - Naloxone 7.9 ng/mL

In the last 9 months, we found fentanyl in 11 other DUID cases out of which only 2 cases had fentanyl only. The remaining 9 cases were in combination with other drugs such as alprazolam, THC, oxycodone, morphine, buprenorphine, amphetamine and methamphetamine. The concentration ranged from 0.1 to 4.7 ng/mL (mean 1.8 ng/mL; median 1.1 ng/mL).

This case had concentrations of fentanyl approximately 10x more than the mean found in our DUI cases and falls in the range of concentrations found in postmortem cases[1]. This concentration is equivalent to the initial levels reached of 18 ng/mL when a 6.4 ug/kg IV dose of fentanyl was given to 5 healthy young men[2].

References

1. Hilke Andresen*, Annemarie Gullans, Michele Veselinovic, Sven Anders, Achim Schmoldt, Stefanie Iwersen-Bergmann and Alexander Mueller. Fentanyl: Toxic or Therapeutic? Postmortem and Ante mortem Blood Concentrations after Transdermal Fentanyl Application. J Anal Toxicol (2012) 36 (3): 182-194.

2. Baselt R.C. Fentanyl. In: Baselt R.C., ed. Disposition of Toxic Drugs and Chemicals in Man. Foster City: Biomedical Publications, 8th edition, 2008: 616-7.

Carfentanil Identified in Two Driving Under the Influence of Drugs Cases

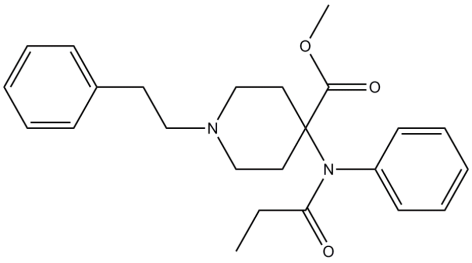
Submitted by **Nicholas B. Tiscione[1] and Kevin G. Shanks[2]**

[1]Palm Beach County Sheriff's Office, West Palm Beach, FL

[2]Axis Forensic Toxicology, Indianapolis, IN

Carfentanil is a synthetic opioid that has been used for the sedation of large animals (1) and has not been evaluated for human use (see Figure 1 for chemical structure). It has a potency that is approximately 10,000 times that of morphine (100 times that of fentanyl) based on animal models (2). Traditional human dosing and pharmacokinetic studies have not been reported, although labeled [11C] carfentanil has been used to study opioid receptors (3). A recent study describes a possible metabolite profile based on human liver microsomes and hepatocyte incubation studies along with a thorough review of the drug (4). No studies on the stability of carfentanil in biological matrices have been reported. There exists only a single case report detailing accidental human exposure to carfentanil in veterinary medicine (5). Because of its potency, the drug has also been implicated in chemical warfare applications (6). In mid -2016, US news media outlets reported that carfentanil had emerged as an adulterant in street heroin (7-9). However, information remains limited, such as predictive blood levels that might be expected in driving under the influence of drugs (DUID) cases. Extremely low sub-nanogram per milliliter levels would be expected due to carfentanil's potency, the delay in blood collection, and unknown stability in whole blood while the sample is stored prior to analysis. Two DUID blood cases involving carfentanil are presented as a reference for laboratories seeking to provide appropriately sensitive analysis for this compound.

Figure 1. Structure of carfentanil



The blood samples were analyzed by the Palm Beach County Sheriff's Office (PBSO) Toxicology Unit using headspace gas chromatography with simultaneous flame ionization and mass spectrometric detection (HS-GC-FID/MS) for ethanol and other volatiles, an 11 panel enzyme-linked immunosorbent assay (ELISA) (amphetamines, barbiturates, benzodiazepines, buprenorphine, carisoprodol, cocaine metabolite, fentanyl, methamphetamine, opiates, oxycodone, and cannabinoids) using kits from Neogen (Lexington, KY) and a general basic extraction with gas chromatography-mass spectrometry (GC-MS) full scan analysis for drugs. Positive results were confirmed by PBSO using liquid chromatography tandem mass spectrometry (LC-MSMS) for the free drugs. Testing for selected fentanyl analogs and opioids (including acetyl fentanyl, 3-methylfentanyl, 4-methoxybutyrylfentanyl, acrylfentanyl, beta-hydroxythiofentanyl, butyrlfentanyl, carfentanil, furanylfentanyl, para-fluorobutyrylfentanyl/ Para-fluoroisobutyrylfentanyl and U47700) was performed by Axis Forensic Toxicology using LC-MSMS with a recently lowered reporting limit of 10 pg/mL for carfentanil (100 pg/mL previously). An extracted ion chromatogram (EIC) of a 10 pg/mL standard and each of the two cases is presented in Figure 2. Blood specimens were stored under refrigeration except during transport to each laboratory. Specimens were hand delivered to the PBSO laboratory and were shipped via overnight mail service to Axis Forensic Toxicology. Analysis results and case information for both cases are summarized in Table I.

Both cases had similar histories. Case one involved a 24 year old white male who was passed out behind the wheel after crashing his vehicle into a pole in a parking lot. Witnesses were unable to arouse the individual and paramedics were called. The paramedics administered naloxone and the individual regained consciousness. The individual admitted to injecting heroin that night and taking buprenorphine/naloxone a week prior. Two capsules and a hypodermic syringe were recovered inside the vehicle. Insufficient sample remained in either capsule for analysis. Whole blood specimens were collected approximately one hour after the incident in 10 mL glass vacuum evacuated tubes containing 20 mg potassium oxalate and 100 mg sodium fluoride. Volatiles testing was negative. Toxicological analysis identified fentanyl (< 1.0 ng/mL), acetylfentanyl (0.39 ng/mL), and carfentanil (13.3 pg/mL).

Case two involved a 29 year old white male that was passed out behind the wheel at the drive thru of a fast food restaurant with the

Carfentanil Identified in Two Driving Under the Influence of Drugs Cases *(CONTINUED)*

Table I. Summary of Case Information and Results

	Case Number	
	1	2
Demographic Information	24 year old white male	29 year old white male
Incident date, time	8/16/16, 16:47	9/10/16, 00:45
Blood draw date, time	8/16/16, 17:46	9/10/16, 01:16
BAC Analysis	9/12/2016	9/12/2016
ELISA Analysis	9/13/2016	9/13/2016
Confirmation Analysis	9/15/2016	9/15/2016
Fentanyl Analog Analysis	10/24/2016	10/24/2016
ELISA Results	Barbiturates, Fentanyl	Negative
Confirmation Results	Fentanyl < 1.0 ng/mL, weak Phenobarbital (not reported, LOD = 0.2 ug/mL)	6-monoacetylmorphine < 5.0 ng/mL, morphine < 10 ng/mL
Fentanyl Analog Analysis Results	Acetylfentanyl 0.39 ng/mL, Carfentanil 13.3 pg/mL	Carfentanil 43.5 pg/mL

engine running and his foot on the brake. Witnesses were not able to rouse the driver and paramedics were called. The paramedics administered naloxone and the driver regained consciousness. At the hospital, the driver appeared sluggish and groggy and his pupils were constricted. Whole blood specimens were collected approximately 30 minutes after the incident in 10 mL glass vacuum evacuated tubes containing 20 mg potassium oxalate and 100 mg sodium fluoride. Volatiles testing was negative. Due to the case history confirmation analysis for opioids was performed even though ELISA testing was negative. The confirmation analysis at PBSO was performed on two separate aliquots to confirm the presence of the drugs in the absence of positive ELISA results. Toxicological analysis identified 6-acetylmorphine (< 5.0 ng/mL), morphine (< 10 ng/mL), and carfentanil (43.5 pg/mL).

Due to the extreme potency of carfentanil, analysis methods must be very sensitive, especially when testing is performed for DUID cases in which blood specimens are collected sometime after the incident. One blood DUID case unrelated to the two cases presented above that was analyzed previously by Axis Forensic Toxicology using a 100 pg/mL reporting limit was negative for carfentanil. In this case, a capsule and syringe were recovered from the driver's vehicle and carfentanil was tentatively identified in the capsule (no reference standard was available at the time for confirmation) by the PBSO Drug Chemistry Unit. The case history indicated a possible heroin overdose and the driver admitted to using heroin after responding to naloxone. The blood in this case was collected approximately 100 minutes after the incident. No alcohol or drugs were identified by PBSO. Axis Forensic Toxicology did not identify any fentanyl analogs. Given the results of the two DUID cases presented in which carfentanil was detected, it seems that the reporting limit for carfentanil analysis should be no higher than 10 pg/mL to be adequate to identify the compound in DUID blood cases.

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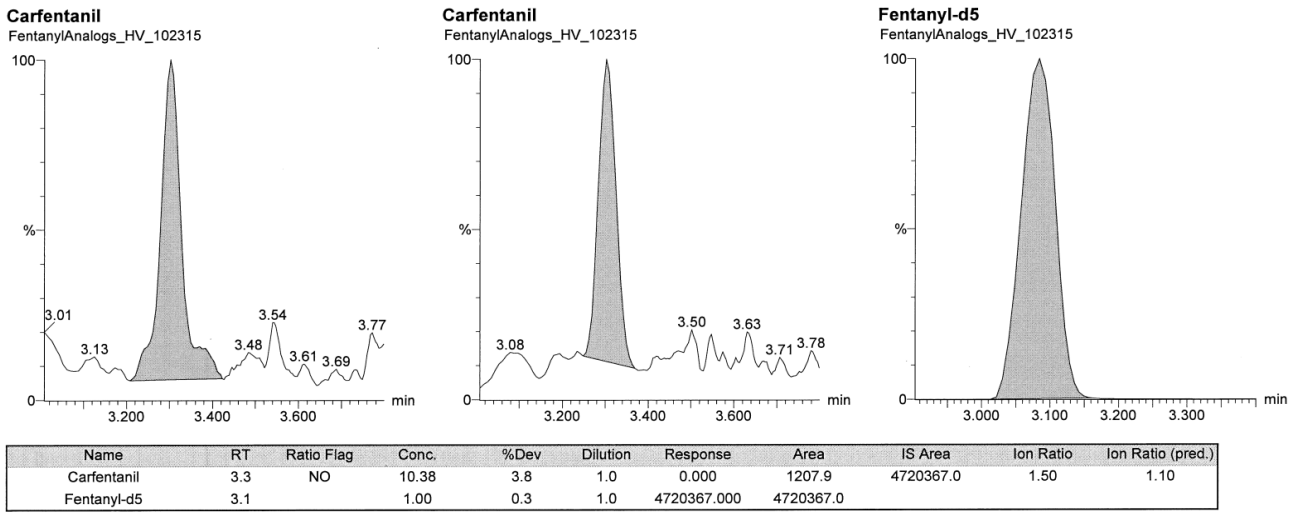
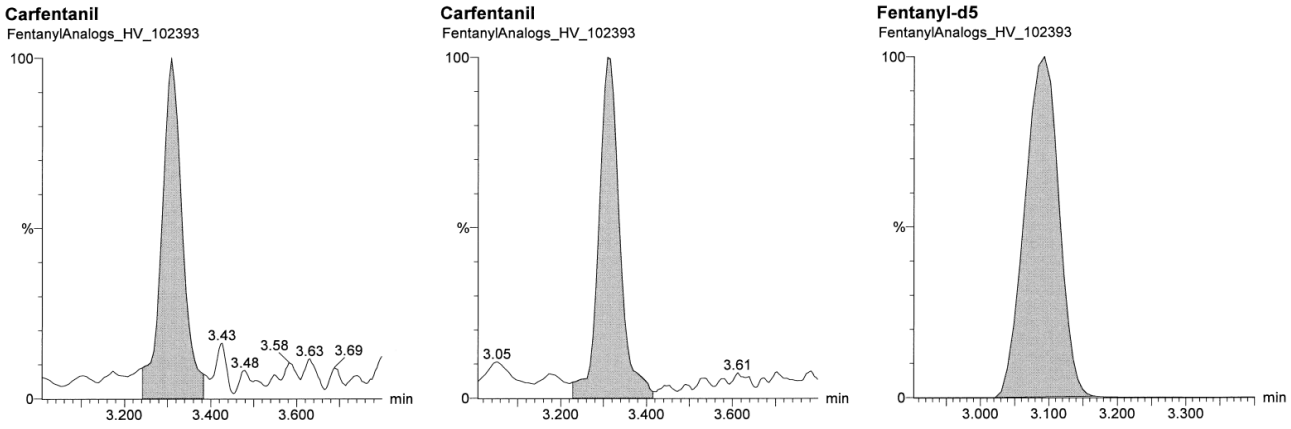
Carfentanil Identified in Two Driving Under the Influence of Drugs Cases

(CONTINUED)

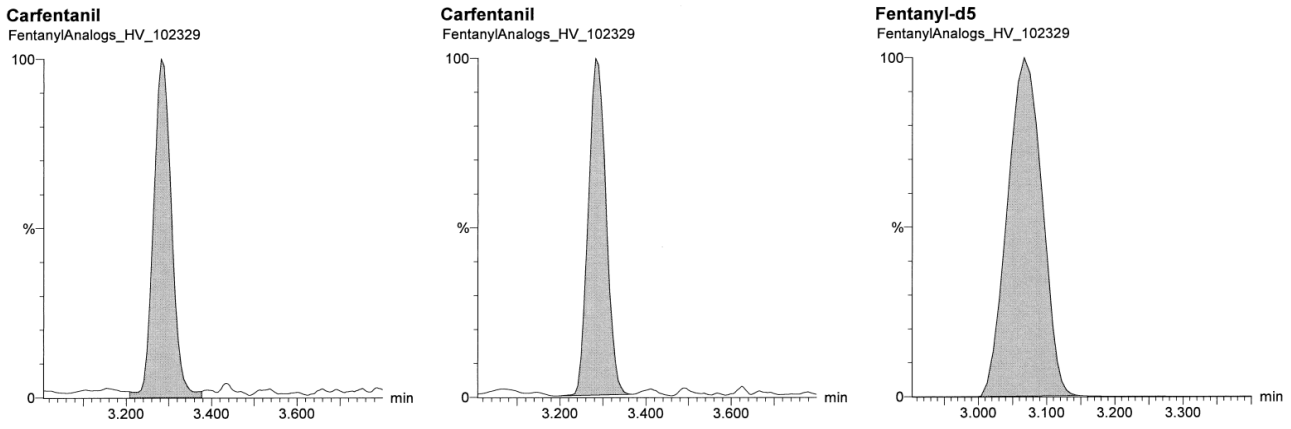
Figure 2. Top: EIC for carfentanil standard at 10 pg/mL with fentanyl-d5 internal standard; Middle: EIC for Case one; Bottom: EIC for Case two



Name	RT	Ratio Flag	Conc.	%Dev	Dilution	Response	Area	IS Area	Ion Ratio	Ion Ratio (pred.)
Carfentanil	3.3	NO	10.38	3.8	1.0	0.000	1207.9	4720367.0	1.50	1.10
Fentanyl-d5	3.1		1.00	0.3	1.0	4720367.000	4720367.0			



Name	RT	Ratio Flag	Conc.	%Dev	Dilution	Response	Area	IS Area	Ion Ratio	Ion Ratio (pred.)
Carfentanil	3.3	NO	13.30		1.0	0.000	1461.0	4834042.0	1.01	1.10
Fentanyl-d5	3.1		1.03	2.7	1.0	4834042.000	4834042.0			



Name	RT	Ratio Flag	Conc.	%Dev	Dilution	Response	Area	IS Area	Ion Ratio	Ion Ratio (pred.)
Carfentanil	3.3	NO	43.55		1.0	0.001	3463.6	4432471.0	1.15	1.10
Fentanyl-d5	3.1		0.94	-5.8	1.0	4432471.000	4432471.0			

Carfentanil Identified in Two Driving Under the Influence of Drugs Cases

(CONTINUED)

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Journal of Analytical Toxicology
Special SOFT Edition 2017—Call for Papers

Submitted by **Dayong Lee, Ph.D.**

Greetings. The Journal of Analytical Toxicology (JAT) is the official journal of the Society of Forensic Toxicologists (SOFT). Each year JAT produces a special issue that coincides with the SOFT annual meeting. I would like to remind fellow toxicologists that the time to plan for the 2017 SOFT meeting in Boca Raton, FL, is fast approaching and so are the deadlines for abstract and manuscript submissions for the 2017 JAT Special Issue. Publishing peer-review articles is the key to disseminating information within the scientific community. I implore you to participate in this important process by submitting a manuscript for consideration and/or by serving as a reviewer. The submitted manuscripts will be carefully reviewed for novelty, technical quality and scientific design. All manuscripts accepted for the special issue with a SOFT member as the first author are eligible for the 2017 Experimental Design and Impact on Toxicology (EDIT) Award. This prestigious annual award recognizes the lead author of the manuscript selected for its outstanding scientific content and impact on forensic toxicology. Please be advised that the timeline for the review and revision of the manuscripts for the special issue is tight, hence timely participation is essential. This issue will be doubly special as we will be holding a joint meeting of SOFT and the International Association of Forensic Toxicologists (TIAFT). I would like to thank the incoming president, Dr. Goldberger, for the great honor of allowing me to serve as the guest editor for 2017. I look forward to receiving many valuable contributions to the literature of forensic toxicology.

Submit your manuscript at http://jat.oxfordjournals.org/ and designate the manuscript for the SOFT Special Issue.

DEADLINES: January 27, 2017: Title and abstract submissions due
February 10, 2017: Completed manuscripts due

DRUGS IN THE NEWS—DEA Schedule 'Pink' (U-47700)

Send interesting ***"Drugs In The News"*** articles to
Section Editor **Laureen Marinetti, Ph.D., F-ABFT,**
Lmarinetti@redwoodtoxicology.com

The Drug Enforcement Administration (DEA) has announced the temporary placement of 3,4-dichloro-N-[2-(dimethylamino)cyclohexyl]-N-methylbenzamide, also known as U-47700, into Schedule I of the Controlled Substances Act effective November 14, 2016. The scheduling of U-47700 will be in effect for two years with the possible addition of one year pending the completion of the regular (permanent) scheduling process.

The first report of U-47700 was in the patent literature in 1978 by Szmuszkovicz and later in the scientific literature by a research group at The Upjohn Company (Szmuszkovicz, 1982). According to these two publications, U-47700 produces a typical morphine-like pharmacological profile in mice. The synthetic opioid U-47700 is a mu opioid receptor agonist and is a member of the benzamide amine structural class (Cheney, 1985). Users describe U-47700 as having effects similar to other opioids and is marketed as such either knowingly (the user knows they are getting U-47700) or unknowingly (the user thinks it is some other opioid-like drug). The population abusing U-47700 appears to overlap with the population abusing prescription opioid analgesics, heroin and other illicit opioids. Insufflation and injecting of U-47700 have been reported as routes of administration. The negative effects documented in the scientific literature are also consistent with other opioids.

The first laboratory submission of U-47700 was recorded in October of 2015. Between October 2015 to September 2016, state and local forensic labs have reported 88 additional recorded submissions, according to the National Forensic Laboratory Information System (NFLIS). On November 1, 2016, the DEA queried its laboratory information management system (STARLiMS) and found 45 reports containing U-47700 from 12 states (CA, CT, FL, ME, MT, ND, NJ, NY, TN, TX, WV) and the District of Columbia. In addition, in 2015 and 2016 the DEA, through NFLIS, law enforcement and email communications, was made aware of the identification of U-47700 from toxicology reports and submitted evidence in several states including; AR, CA, CO, CT, FL, GA, IA, KY, MO, MT, NH, NJ, NY, NC, ND, OH, OK, OR, PA, TX and WI.

Seizures of U-47700 have been found in powder form, counterfeit tablets that mimic pharmaceutical opioids, glassine bags (some stamped with logos mimicking heroin packaging), envelopes and knotted corners of plastic bags. U-47700 has been encountered as a single substance and in combination with other substances including heroin, fentanyl and furanyl fentanyl. The DEA has no documented seizures of U-47700 prior to 2015. U-47700 is available on the Internet and is marketed as a research chemical. Because users are likely to obtain U-47700 through non-regulated sources, the identity, purity and quantity is uncertain, thus posing a significant risk to the user.

The DEA said it has confirmed 46 deaths from U-47700 occurring in New York (31), New Hampshire (1), Ohio (1), Texas (2), Wisconsin (1) and North Carolina (10). Additionally, in September of 2016 two 13-year-old Park City, Utah boys who died within 48 hours of each other may have been using U-47700. The DEA believes the number of both fatal and non-fatal overdoses is likely under reported as many toxicology labs do not screen for U-47700.

Quotes from the media report that U-47700 is "part of a family of synthetic opioids that are many times stronger and deadlier than heroin", "is eight times stronger than heroin" and "This stuff is so powerful that if you touch it, you could go into cardiac arrest". The opiate binding and receptor data as well as behavioral data showed that U-47700 has a pharmacological profile similar to morphine. So be on the look out for U-47700, it is likely in your state. I recently searched for U-47700 on the Internet and got a hit on Amazon. The hit was for a product called Tuff Country 47700 U-bolts. However, on the top of that same page I saw NSI-189 Powder, a research powder, does this ever end?

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Background, Information and Evaluation of "Three Factor Analysis" (Factors 4, 5 and 6) for Temporary Scheduling of U-47700, Drug and Chemical Evaluation Section, DEA, Nov. 2016.

NEW DRUGS AND TECHNOLOGY TIDBITS

Send interesting *"New Drugs and Technology Tidbit"* articles to
Section Editor **Sherri Kacinko, Ph.D.**
Sherri.Kacinko@NMSLABS.com

NEW DRUG: Dibutylone

Submitted by **Alex Krotulski** (alex.krotulski@frfoundation.org)
Center for Forensic Science Research and Education, Willow Grove, PA

(Image source: Contributions to Facebook Groups Associated with EDM festivals such as Ultra, Tomorrow World and EDC Vegas)

Dibutylone is one of the newest synthetic stimulants to be introduced into the ever-evolving designer drug market for "ecstasy" and "molly" users. Today's "ecstasy" users often seek after and believe to be purchasing MDMA, but in reality many users are unaware of what they are ingesting. MDMA has a longer history and remains the preferred stimulant of choice to those who desire its psychoactive properties, but many compounds belonging to the designer stimulant class are emerging. In recent years, the prevalence of MDMA has declined as the emergence of methylone and other related beta-keto- analogues has been documented. Methylone was the first of these synthetic cathinones reported, followed by ethylone and butylone, and then by dimethylone (all isobaric forms). Recently, laboratories are detecting dibutylone, an N-methylated form of butylone. Following this trend, there have been reports in online drug forums of diethylone, an N-ethylated form of ethylone, but to recent knowledge no laboratory has reported this as a positive finding. Pentylone, N-ethyl-pentylone, eutylone, and ephylone have additionally been documented or reported.

Dibutylone, bk-DMBDB or bk-MMBDB, is a member of the amphetamine, cathinone, and phenethylamine drug classes, with anticipated properties similar to synthetic cathinones mentioned above (1). Like many other synthetic cathinones, dibutylone can be purchases in dark web markets and is sold as a "bath salt" or "plant food." Dibutylone is not scheduled in the United States (2). Very little literature is available on dibutylone, and the majority of studies only incorporate the compound into testing procedures. Two articles involving the analysis of seized materials identified dibutylone, three powders submitted by police agencies of material purchased over the internet (3) and one powdery sample with an average purity of 97% (4). The overall pharmacological effects of dibutylone are still undocumented, but a recent article describes the overall psychopathological consequences of many synthetic cathinones including dibutylone, listing increased alertness, euphoria, hallucinations, agitation, aggression, paranoia, and decreased dopamine transporters; but it is important to note that these effects are speculative as the article included no toxicological confirmations (5). The metabolic fate of dibutylone is yet to be published, but it is widely speculated that dibutylone will metabolize to butylone, due to positive case findings, and other reported beta-keto metabolites previously in the literature.

NEW DRUG: Dibutylone *(CONTINUED)*

Table 1: Chemical Characteristics of Dibutylone

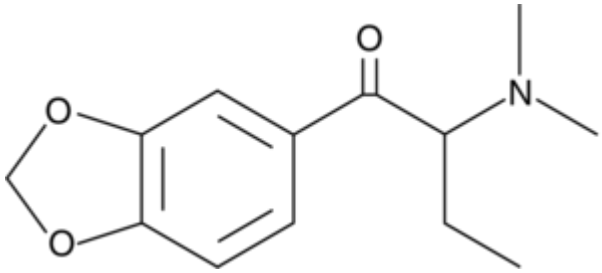
Nomenclature	1-(1,3-benzodioxol-5-yl)-2-(dimethylamino)-1-butanone
Formula	$C_{13}H_{17}NO_3$
Molecular Weight	235.28 g/mol
Exact Mass	235.1204 Da
λ_{max}	237, 284, 322 nm
Structure	

Figure 1: LC-QTOF ESI Mass Spectrum of Dibutylone Acquired using a SCIEX TripleTOF® 5600+ by Information Dependent Acquisition (Collision Energy: 35±15 eV)

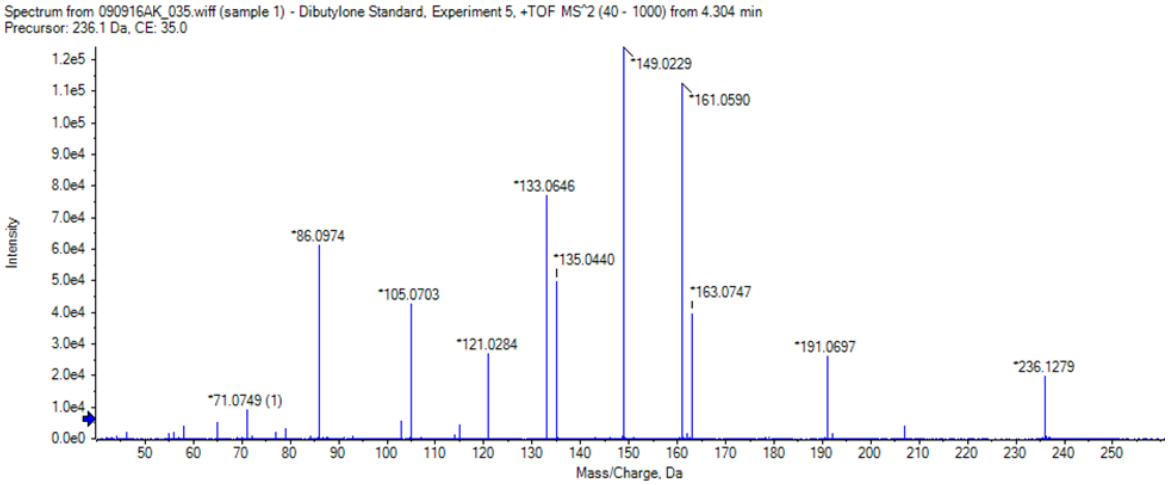
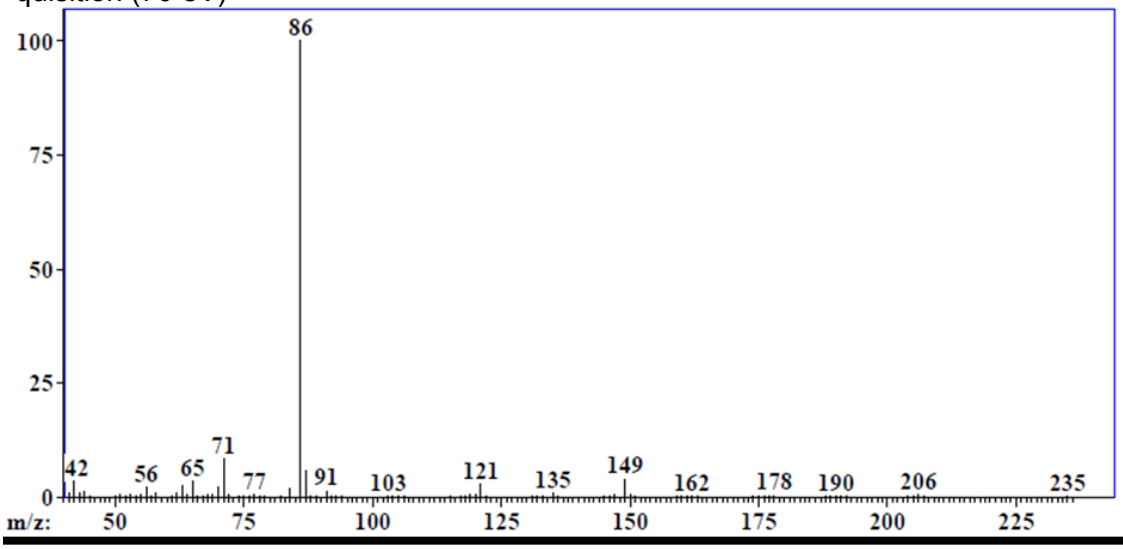


Figure 2: GC-MS EI Mass Spectrum of Dibutylone Acquired using an Agilent 5975 by Scan Acquisition (70 eV)



NEW DRUG: Dibutylone *(CONTINUED)*

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OSAC Announcement

The Organization of Scientific Area Committees for Forensic Science (OSAC) have announced a SAVE THE DATE for the OSAC Scientific Area Committee Public Status Reports & Open Discussion Events at the 2017 AAFS Conference in New Orleans. For more information, please follow the link below:

https://www.nist.gov/topics/forensic-science/osac-newsletter-november-2016#SaveTheDate

IN MEMORIAM
Betty Buchan Monsour

It is with sadness that we recently learned of the passing of long time SOFT member, Betty Buchan Monsour. Betty passed away on January 5, 2016, after a battle with cancer. Betty was a thirty year member of SOFT. Her husband, Dr. John V. Monsour writes, “She was proud of her affiliation with this organization (SOFT) and would have greatly appreciated the recognition of her 30 year membership.”

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February 1 for March Issue

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2017:	Boca Raton, FL	Sept. 10-15, 2017	Ruth Winecker/Dan Anderson
2018:	Minneapolis, MN	Oct. 7-12, 2018	Loralie Langman/Paul Janetto
2019:	San Antonio, TX	Oct. 13-18, 2019	Veronica Hargrove/Brad Hall
2020:	San Diego, CA	Sept. 20-25, 2020	Denice Teem

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Volume 40, Issue 4

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SOFT 2016 DALLAS
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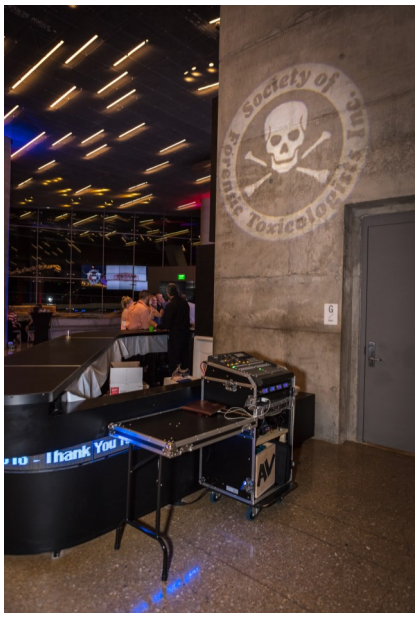

SOFT 2016 DALLAS
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