Society of Forensic Toxicologists, Inc.

TOXTALK®

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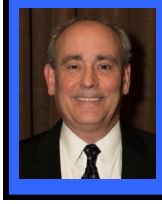


PRESIDENT'S MESSAGE

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

The joint SOFT-TIAFT meeting is only days away! The annual meeting will be held at The Waldorf Astoria Boca Raton Resort and Club, an elegant venue with access to the beach, golf courses and numerous restaurants and a spa.

I would like to take this opportunity to acknowledge those individuals who have worked day and night to organize what will be the largest gathering ever of forensic toxicologists – hosts Dan Anderson and Ruth Winecker, meeting Treasurer Marc LeBeau, scientific chairs Robert Johnson and Robert Kronstrand, workshop chairs Diane Boland and Frank Peters, and vendor liaison Jarrad Wagner. There are numerous other individuals on the annual meeting committee who have worked tirelessly to ensure the success of the meeting. I would also like to thank SOFT Executive Director Beth Olson and Administrative Assistant CC Watson for their support and facilitation of the annual meeting.

The scientific program includes 17 workshops, as well as 186 platform presentations and 222 poster presentations. Be prepared to immerse yourself in a weeklong event highlighting new psychoactive substances, postmortem toxicology, clinical toxicology, analytical toxicology, general toxicology, alternative matrices, and driving under the influence of drugs.

The social program includes the Welcome Reception, Beach Party, Dinner Cruise, and President's Banquet and Closing Ceremony. There will be ample opportunity to spend time and network with your friends and colleagues.

INSIDE THIS ISSUE:

PRESIDENT'S MESSAGE *(CONTINUED)*

I would like to encourage everyone to attend the SOFT Annual Business meeting on Thursday afternoon. In addition to the usual business, including reports from the SOFT officers and committee chairs, I am planning to brief the membership regarding recent outreach efforts in response to the emergence of new psychoactive substances. I am looking forward to spending the week with my friends and colleagues. Best wishes for a safe journey to Boca Raton.

SOFT-TIAFT 2017 Boca Raton Update

Submitted by **Ruth E Winecker and Dan Anderson**

Dear Friends and Colleagues:

All the preparations are complete (or nearly complete) and we are eager to welcome you all to the 2017 joint meeting of the Society of Forensic Toxicologists and The International Association of Forensic Toxicologists in September. This is the fifth joint meeting of our two scientific organizations, the 55th meeting of TIAFT and 48th meeting of SOFT. All in all, SOFT and TIAFT have been committed to education, fellowship, scholarly pursuits and collaboration of toxicological scientists for more than half a century. As always, the joint meeting will present many opportunities for these activities and we hope that you embrace it fully in the beautiful setting of the Waldorf Astoria Boca Raton Club and Resort. Based on current registration, there will be ~1300 of your fellow toxicologists in attendance. For those unable to join us, we will miss you and hope we will see you next year.

The scientific program is chock full of content with 17 full and half day workshops on a variety of topics and 186 platform presentations and 222 posters. Due to the overwhelming response of quality scientific abstracts, the decision was made to run dual scientific sessions and divide the posters into blocks by topic. Other learning opportunities include exhibitor hosted lunch and learning sessions on Sunday and Monday. Be sure not to miss the opening ceremony on Monday evening with two fantastic plenary speakers, brought to you with support from the Forensic Toxicology Center of Excellence. Speakers John Collins and Diana Cabra will talk about leading the next generation of forensic scientists and the impact and importance of forensic toxicology testing on DFC victims from a personal perspective, respectively. As a bonus, you can set reminders in the meeting app so as not to miss any of this wonderful content.

Of course, the social program will also provide multiple opportunities for keen discourse between old and new toxicology friends. We will begin the social program on Monday with a welcoming reception, after which you can participate in the annual Elmer Gordon Open Forum; where practitioners gather for a hosted forum on current challenges to the field of forensic toxicology. We hope you brought your board shorts with you as Tuesday evening we will enjoy a Beach Party with tunes by an authentic Steel Drum Band at the Boca Beach Club Pool deck. Wednesday evening we will set sail to enjoy dinner, views of classic South Florida mansions and the sunset on the intercoastal waterway. The week concludes Thursday evening with the Presidents' Banquet and Closing Ceremony and the much anticipated roll call of nations followed by live band entertainment and dancing.

Many thanks are due to the brilliant volunteers who will help run the meeting and helped with meeting preparations including the planning committee, scientific committee, social committee, SOFT office and the BOD's of both SOFT and TIAFT. Of course, the meeting would not happen without the fantastic support from our exhibitors so we encourage you to drop by their booths and say thanks. On behalf of the organizing committee we hope everyone enjoys the mix of traditions unique to SOFT and TIAFT meetings.

Ruth E Winecker

Dan Anderson

Co-Chairs 2017 Planning Committee

American Academy of Forensic Sciences Meeting

Submitted by Section Secretary **Nikolas P. Lemos**

We are only a few months away from the 70th Anniversary Scientific Meeting in Seattle, Washington, where the chosen theme for this year's anniversary meeting is "***Science Matters***."

Our host city, Seattle, is an exciting urban city surrounded by unmatched natural beauty. Adventure awaits you before, during and after the Annual Meeting whether you are visiting for the first time or you are a seasoned visitor! The city is on Puget Sound in the Pacific Northwest and is surrounded by water, mountains and evergreen forests. It contains thousands of acres of parkland. Seattle is Washington State's largest city, and is home to a large tech industry, with many industrial giants headquartered in its metropolitan area. The futuristic Space Needle (www.spaceneedle.com), a 1962 World's Fair legacy, is its most iconic landmark.

Our Section's scientific program, which this year is in the very capable hands of our Program Chair **William (Bill) Johnson** (william.johnson@slh.wisc.edu) and Program Co-Chair **Sherri Kacinko** (sherri.kacinko@nmslabs.com), will start as always with our Wednesday Poster session and will continue with oral presentations on Thursday and Friday including our traditional special sessions on ***Drugs & Driving*** and ***Postmortem Pediatric Toxicology***.

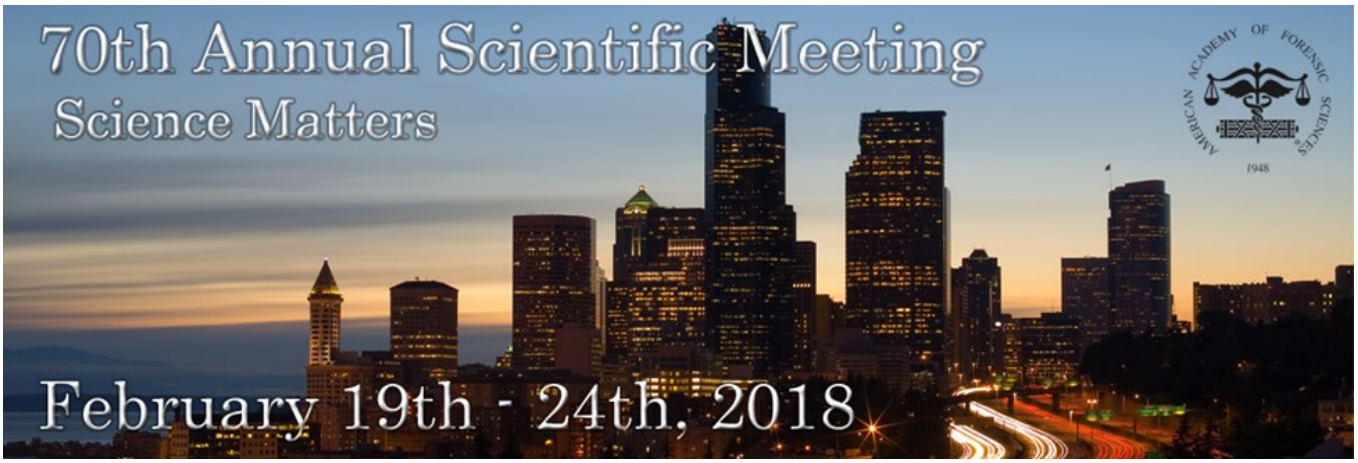
The annual ***Toxicology Section Luncheon*** (which is **not** included in the basic meeting registration and which requires an additional registration and payment available only during pre-registration) will take place once again immediately prior to the ***Toxicology Section Business Meeting*** on Wednesday. During the Business Meeting, we will also be presenting our annual section Award Winners for the Alexander O. Gettler Award, the Rolla N. Harger Award, the Ray Abernethy Award, as well as the Irving Sunshine Award.

New this year will be our Section's participation in a ***Multidisciplinary Session on Opioids*** proposed for Thursday morning (8:30-11:00 AM) instead of our traditional Annual Toxicology Lectureship. Sherri Kacinko will be the speaker from the Toxicology Section at this much-needed and highly-anticipated multidisciplinary session on Opioids.

To motivate our Section membership to apply for promotion, for the first time this year we are going to randomly select an **Applicant for Promotion** within the Toxicology Section and waive their meeting registration fees! This year, the meeting registration fees are $295 (if completed by the January 18 pre-registration deadline) or $420 (!!!) if you miss the pre-registration deadline and register on January 19 or later. The Meeting Registration Fee includes admittance into AAFS sessions starting with the Tuesday evening Welcoming Reception through the Saturday morning Scientific Sessions and includes a complimentary beverage ticket with all registrations except Student, Daily, and Workshop Only. (Note: Meeting registration excludes Special Functions.) So, if you want to have a chance to a **FREE Annual Meeting Registration** saving yourself hundreds of dollars, please submit your **Application for Promotion** (Associate Member to Member OR Member to Fellow) by the Academy's deadline as stated in the Basic Promotion Requirements: "*The criteria for promotion are applicable to all members seeking promotion to Member or to Fellow. Applications must be received and completed* ***by October 1*** *to be considered for approval at the AAFS annual meeting*."

Finally, we are enormously grateful to our Section's commercial supporters – even at this early stage we have confirmed support from **Agilent Technologies** (www.agilent.com), **Cayman Chemical** (www.caymanchem.com), **Center for Forensic Science Research and Education at the Frederic Rieders Family Foundation** (https://www.forensicscienceeducation.org/), **NMS Labs** (www.nmslabs.com), **Immunalysis Corporation** (www.immunalysis.com), and **Lipomed AG** (https://www.lipomed.com/). Please make sure you visit them and thank them for their support.

American Academy of Forensic Sciences Meeting *(CONTINUED)*



Midwest Association For Toxicology and Therapeutic Drug Monitoring (MATT) Annual Meeting 2018

Annual Meeting 2018
April 12-13, 2018
Hyatt Regency Indianapolis
Indianapolis, IN

Are you ready to visit Indy?

We are currently developing the scientific program for the 2018 Annual Meeting of the Midwest Association for Toxicology and Therapeutic Drug Monitoring (MATT) in Indianapolis and want your input and ideas!

Everything is fair game – from historical drugs of abuse to novel psychoactive substances, from case reports and studies to development/validation of analytical methods, from running a cost effective laboratory to managing scientific staff and instrumentation in the 21st century. We want your ideas!

Please encourage your fellow laboratory technologists/technicians and scientists working in the discipline of toxicology or students working towards a B.S., M.S,. or Ph.D. in a related field, to submit a presentation and apply for the **Sunshine Wong Travel Award by February 28th, 2018**. The winner will receive a $1000 award to cover travel, lodging, and meeting registration for MATT 2018, as well as a one year membership to MATT!

Contact us for more information. Look forward to seeing you in Indianapolis!

Scientific Program Committee

Kevin G. Shanks, M.S., D-ABFT-FT, kshanks@axisfortox.com
Matthew Lambing, M.S.F.S, mlambing@indigobio.com
Michael Wagner, Ph.D., F-ABFT, micawagn@iupui.edu

Recommended Minimum Performance Limits for Common DFC Drugs and Metabolites in Urine Samples - Document Update

Submitted by **The DFC Committee**

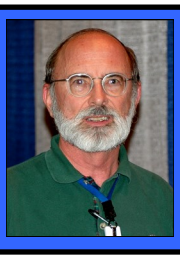
In June of 2017, SOFT's Drug-Facilitated Crimes (DFC) Committee updated the document entitled: *Recommended Minimum Performance Limits for Common DFC Drugs and Metabolites in Urine Samples.* The following updates were made to the previous 05/2016 version of the document:

- The document was reformatted for easier reading.
- Columns were reorganized to highlight parent drug rather than target analyte.
- Drug Classes were expanded.
- Drug classes, and the drugs within, were alphabetized.
- Notations were made by drugs that are not legally available in the U.S.
- The following drugs were added:
  - Heroin and monoacetylmorphine
  - Norhydrocodone
  - Noroxycodone
  - Tapentadol and desmethyltapentadol
  - *n*- and *o*-desmethyltramadol
  - mCPP (trazodone metabolite)
  - Carbinoxamine
  - Dextrorphan
  - Cetirizine and norchlorcyclizine
  - Meclizine
  - Chlorpromazine
  - Olanzapine
  - Thioridazine
  - Ziprasidone
  - Bromazepam and α-hydroxybromazepam
  - Clobazam
  - Clotiazepam
  - Estazolam
  - Etizolam
  - Flubromazepam
  - Flurazepam and desalkylflurazepam
  - Loprazolam
  - α-hydroxy midazolam
  - Prazepam
  - Tetrazepam
  - Zopiclone-n-oxide
  - Gabapentin
  - Pregabalin
  - Suvorexant
  - Topiramate
  - Cocaethylene and methylecgonine
  - Methylphenidate and ritalinic acid
- The following analytes were removed:
  - Hydrocodol and dihydrocodeinone
- The following minimum performance limits were updated:
  - 11-carboxy-THC was raised from 10 to 20 ng/mL to align with routine workplace drug testing.
  - Valproic acid was raised from 50 ng/mL to 5 µg/mL to more closely align with expected urinary concentrations after single doses.
  - Secobarbital was raised from 20 ng/mL to 25 ng/mL to align with the other barbiturate values.
  - MDA and MDMA levels were raised from 10 ng/mL to 50 ng/mL to align with other stimulants.

The current version of the document can be found at:

http://www.soft-tox.org/files/MinPerfLimits_DFC2017.pdf

To learn about how to reach these detection limits, and more about toxicology and drug-facilitated crime, please come to Workshop 11 on September 11, 2017 at the joint SOFT-TIAFT meeting in Boca Raton, Florida. Workshop space is still available as of the time of this publication. Hope to see you in Boca Raton!!



CASE NOTES

Send interesting *"Case Notes"* to Section Editor

Matthew Barnhill, Ph.D., F-ABFT

mbarnhilljr@gmail.com

Fentanyl and Designer Opioid-Related Deaths in Allegheny County

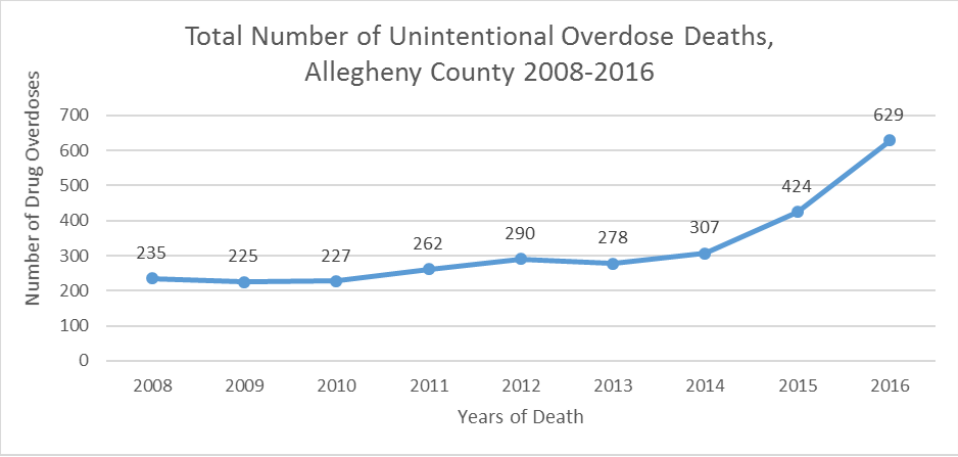
Submitted by **Alesia Smith and Daniel Kinkaid**

The Allegheny County Medical Examiner's Office serves a population of approximately 1.2 million people and its toxicology laboratory performs analyses on all postmortem cases within this jurisdiction. In the last two years, a dramatic rise in accidental overdose deaths has occurred. The majority of these overdoses involved fentanyl alone or in conjunction with designer opioids and/or other drugs.

This is not the first time Allegheny County has experienced a fentanyl outbreak. In 1988, the fentanyl analog, 3-methyl fentanyl, also known as China White caused 16 deaths. A second outbreak occurred in 2006 in which fentanyl was responsible for 27 deaths between April 23 and July 24. Aside from these two outbreaks, fentanyl -related deaths were negligible and largely attributable to diverted pharmaceutical drugs, such as the fentanyl transdermal patch.

In 2014, unintentional fentanyl-related deaths rose exponentially from 8 cases in the previous year to 59 cases. Fentanyl-related deaths more than doubled in 2015 causing 123 deaths. In contrast to previous years, non-pharmaceutical fentanyls contributed to these deaths in the form of fentanyl-laced heroin, fentanyl packaged as heroin, or as fentanyl analogs.

In March 2015, a fentanyl analog, acetyl fentanyl, appeared in postmortem casework and contributed to 29 deaths. Acetyl fentanyl was the only drug identified in two of those cases. In both cases, the decedents had a prior history of drug abuse. Decedent 1 was a known IV heroin user. Paraphernalia on scene included an uncapped syringe and glassine bags. The glassine bags were tested in-house and contained acetyl fentanyl. Fresh needle marks on the decedent's left wrist were identified at autopsy. The acetyl fentanyl whole blood concentration was 180 ng/mL. Decedent 2 was known to abuse heroin and powder cocaine. Paraphernalia on scene included a baggie of white powder, later identified by a police laboratory as cocaine. No fresh needle marks were identified at autopsy. The whole blood concentration of acetyl fentanyl was 170 ng/mL. The remaining 27 deaths involved acetyl fentanyl in combination with fentanyl and/or other drugs. Acetyl fentanyl blood concentrations ranged from 1.4 ng/mL to 1300 ng/mL with a mean blood concentration of 136 ng/mL.



By the end of 2016, the number of death cases involving fentanyl rose so high it exceeded heroin as the number one cause of death in Allegheny County's overdose cases for the first time. Fentanyl contributed to 410 deaths constituting over 65% of all unintentional overdose cases. During the same period, a variety of designer opioids began appearing in postmortem casework.

The occurrence of designer opioids presented a challenge to our laboratory when preparing to analyze for these substances. Fentanyl ELISA screening results tested positive but were unable to be confirmed by our quantitative GCMS fentanyl method. After discussion with Immunalysis, the manufacturer of the fentanyl kit

Fentanyl and Designer Opioid-Related Deaths in Allegheny County *(CONTINUED)*

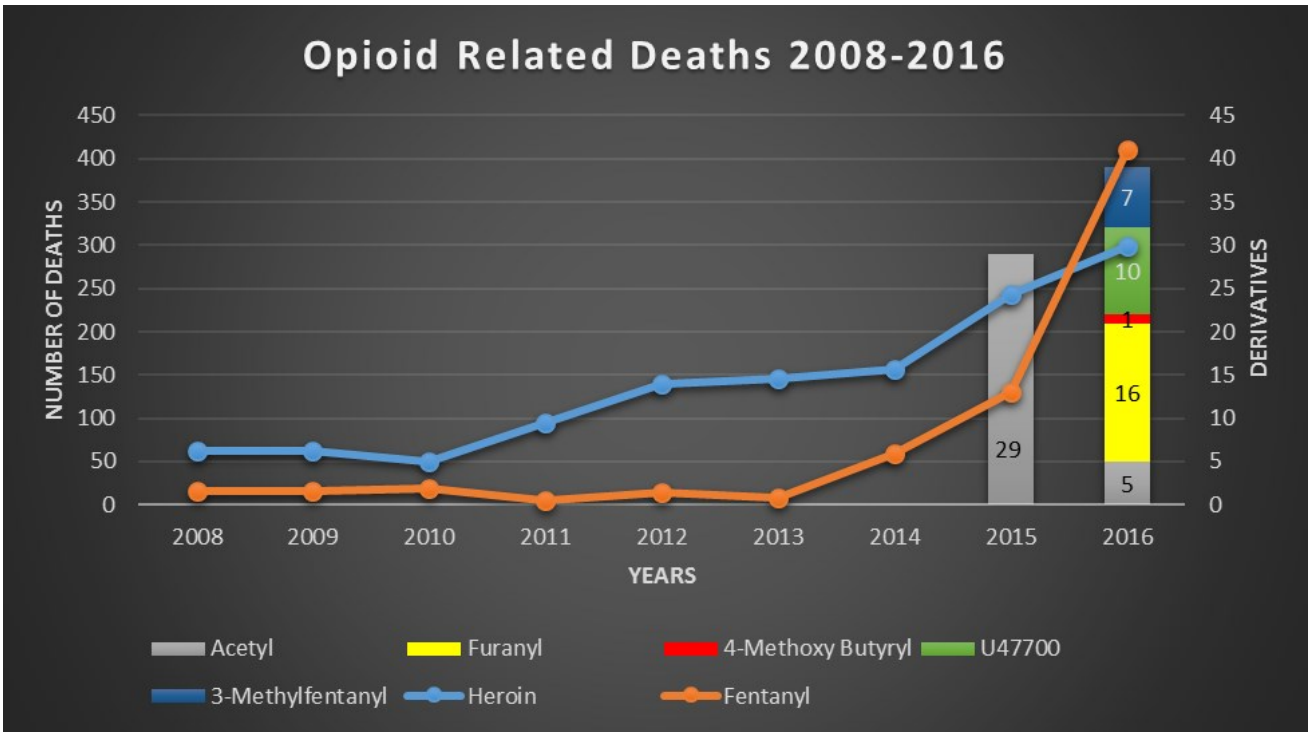
used, it was discovered that some cross-reactivity exists for many of the fentanyl analogs. Any case with a history suggestive of opioid use which yielded negative or trace findings, and any cases with positive fentanyl screens required further analysis.

To address the need for identification, our laboratory purchased certified reference materials from Cayman Chemical. Each of the spectra were added to the GCMS library. All cases requiring further analysis were re-extracted with a low and high control of the purchased standards. Each analog was identified and confirmed by mass spectrum and retention time. No quantitative methods had been validated for these synthetic opioids, so the results were reported qualitatively. Eventually, testing of various analogs became available from outside laboratories and the remaining cases were sent to a reference lab for quantitation in whole blood. Toxicology results, decedent's demographics, and toxicology findings are included in Table 1.

Allegheny County continues to experience a high rate of fentanyl and designer opioid-related deaths. As of June 2017, furanyl fentanyl has been identified in 17 overdoses, U-47700 in 15 and acetyl fentanyl in 2. Other analogs have appeared in postmortem casework including methoxy acetyl fentanyl (3), butyryl/isobutyryl fentanyl (13), parafluorobutyryl fentanyl/parafluoroisobutyryl fentanyl (19), cyclopropyl fentanyl (3), and carfentanil (3). Despropionyl (4-ANPP), a precursor chemical used in the production of fentanyl related compounds and possibly a metabolite of other fentanyl-related compounds presented in at least 30 overdoses.

In 2017, the appearance of designer opioids has tripled and the number of deaths has more than doubled in only half of this year. Moreover, fentanyl itself is still on the rise and has been confirmed as causing at least 208 deaths at the time of this report.

The rapid increase in fentanyl and designer opioid deaths has presented challenges in postmortem casework. It is our hope that sharing this information may be helpful to other laboratories in the detection and identification of fentanyl analogs and other designer drugs.



Note. The lines represent the number of deaths attributed to heroin and fentanyl. The columns represent the number of times each designer opioid appeared in an overdose death. Designer opioids appeared 39 times and in 28 deaths. The numbers differ since more than one synthetic opioid was detected in 9 of the cases.

Fentanyl and Designer Opioid-Related Deaths in Allegheny County *(CONTINUED)*

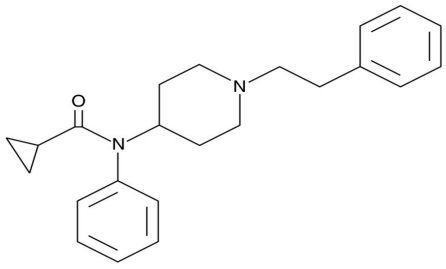
Table 1. Chronological summary of 2016 accidental overdose deaths attributed to synthetic opioids

Case no.	Demographics	Fentanyl and Other Designer Opioids (blood ng/mL)	Other Drugs Detected (blood ng/mL unless otherwise specified)
1	26 B/M	Acetyl fentanyl (300)	Alcohol (0.119%), morphine (35), 6MAM and diacetylmorphine positive in urine
2	28 W/M	4-methoxy-butyryl fentanyl positive U-47700 (489.7)	Delorazepam positive
3	65 B/M	Cis-3-Methylfentanyl positive	Alcohol (0.128%) Chlordiazepoxide (31), Nordiazepam (26), Morphine (39)
4	25 W/M	Fentanyl (0.5), Furanyl fentanyl (5.5), U-47700 (27.4)	Alprazolam 180
5	43 W/F	Cis-3-Methylfentanyl positive	None
6	58 B/F	Furanyl fentanyl positive	Alcohol (0.209%), Morphine (15)
7	53 B/M	Furanyl fentanyl positive	Alcohol (0.184%), Cocaine (75)
8	20 W/M	Cis-3-Methylfentanyl positive, Trans-3-Methylfentanyl positive	Morphine (14), 6-MAM positive
9	51 W/M	Furanyl fentanyl positive	Cocaine positive in urine
10	25 W/M	Acetyl fentanyl (2.2), Fentanyl (11.4)	Butylone positive in urine, morphine and 6MAM positive in urine
11	23 W/M	Acetyl fentanyl (4.3), Fentanyl (20.9)	Alprazolam (20), morphine (24), 6MAM positive in urine
12	49 W/M	Acetyl fentanyl (5.2), Fentanyl (20.6)	Alprazolam (13), butylone (pos), carisoprodol (0.150mg%), morphine (92), methadone (356)
13	41 W/M	Furanyl fentanyl positive U-47700 positive	Alprazolam (44), Cocaine (85), Morphine positive in urine
14	36 W/M	Furanyl fentanyl positive	Alcohol (0.181%)
15	45 W/M	Acetyl fentanyl (6.7), Fentanyl (28.7)	None
16	52 B/F	Furanyl fentanyl positive	Alcohol (0.105%), Cocaine (112)
17	55 W/M	Furanyl fentanyl (2)	Alcohol (0.156%), Lorazepam (12), Citalopram/escitalopram (2552), Delorazepam (110), Diclazepam (54), Diphenhydramine (224)
18	35 W/M	3-methylfentanyl (1.5)	Amphetamine positive in urine
19	36 W/M	Cis-3-Methylfentanyl positive Trans-3-Methylfentanyl positive	Clonazepam (12), Morphine (13)
20	43 W/M	U-47700 (200)	Lorazepam (88), Delorazepam (290), Diclazepam (81), Morphine (157), 6 MAM positive
21	26 W/M	Furanyl fentanyl positive U-47700 (620)	Alprazolam (37), Cocaine (51), Diazepam (56), Zolpidem (10)
22	44 B/F	Furanyl fentanyl (0.52), Fentanyl (5.8)	Alprazolam (19), Morphine (34), alcohol (0.010%)
23	42 W/M	Furanyl fentanyl (23), U-47700 (330)	Doxepin (555), DMD (479), Morphine (18)
24	48 W/M	Fentanyl (2), Furanyl fentanyl (19), U-47700 (370)	None
25	36 W/M	Fentanyl (1.8), Furanyl fentanyl (140), U-47700 (1400)	Clonazepam (12)
26	33 W/M	Furanyl fentanyl (2.2)	Alcohol (0.231%), Cocaine positive in urine
27	40 B/M	Furanyl fentanyl (11), U-47700 (0.81)	Cocaine (503)
28	43 W/M	Furanyl fentanyl (1.7), U-47700 (300)	None

Identification of Cyclopropyl Fentanyl in Biological Specimens: Using What Is at Your Disposal

Submitted by **Brian Simons and Matthew Juhascik,**
Miami Valley Regional Crime Laboratory / Montgomery County Coroner's Office

Within the last year, structural analogues of fentanyl have exploded as a novel alternative to heroin and other opioids abused recreationally for their euphoric effect. Fentanyl, a synthetic opioid initially used for anesthesia and as an effective adjunct for pain management, is a strong agonist of the μ-opioid receptor with a potency approximately 50 to 100 times that of morphine (1). Fentanyl analogues possess structural modifications that demonstrate similar pharmacology to the parent compound while achieving variable duration of effect and/or potency. Some analogues have such affinity for the μ-opioid receptor that their potency increases in orders of magnitude. Nationally, there has been a strong push to identify newly emerging analogues and trends in their distribution as the opioid epidemic expands. In June 2017, the Georgia Bureau of Investigation (GBI) distributed a written communique describing a new, previously unidentified fentanyl analogue: cyclopropyl fentanyl (2). This analogue contains a cyclopropane ring attached to the carboxamide group.



The toxicology section of the Miami Valley Regional Crime Laboratory / Montgomery County Coroner's Office located in Dayton, Ohio performs antemortem and postmortem toxicology on specimens from regional police agencies and coroner's offices to identify drugs of interest. Around 2014, fentanyl became a consistent player in drug overdoses for both DUI/DWI and rulings of accidental death. The laboratory began screening all cases for fentanyl as part of its drugs of abuse panel by ELISA. In early 2017, the laboratory developed a method for the simultaneous identification of numerous opioid analogues suspected of affecting the local population. The method employs solid phase extraction with LC-MS/MS instrumentation and has routinely identified fentanyl and its metabolites, acetyl fentanyl, acryl fentanyl, furanyl fentanyl and its metabolites, U-47700, butyryl/isobutyryl fentanyl isomers, 3-methylfentanyl, and carfentanil.

The laboratory's standard toxicology panel for suspected drug overdose includes volatiles screening and drugs of abuse by ELISA, which includes fentanyl. Due to the sharp rise in fentanyl and its analogues being consumed in conjunction with or as a replacement for heroin, an acidic and basic drug screen analysis by GC/MS and the aforementioned fentanyl confirmation method by LC-MS/MS are also performed. This provides a three-prong approach to identifying potential opioid analogues present in submitted casework.

In late May 2017, a suspected overdose of a 36 year old white male found deceased with an unknown white powder on his clothing was submitted to the laboratory. Initial ELISA screening was positive for fentanyl. In addition to fentanyl confirmation testing, acidic and basic drug screen analyses were performed. It is the laboratory's practice to extract 146 and 189 ions in the basic drug screen when the fentanyl ELISA is positive. In reviewing the data, it was noted that an unidentified peak was located at a retention time just after fentanyl with the spectrum on the following page.

The spectrum was compared to all available libraries yielding no significant match. It exhibited the proposed iminium (146) and phenethylpiperidine ion (189) routinely seen with fentanyl and fentanyl analogues having substitution on the carboxamide group (3). A 257 ion with the highest abundance response was also present. It was postulated that the loss of a benzyl radical group from cyclopropyl fentanyl would produce the 257 ion.

A standard was purchased from Cayman Chemical and validation was performed to include cyclopropyl fentanyl as part of the LC-MS/MS confirmation assay. Once validated, the sample was re-extracted and confirmed qualitatively. During the validation process, six other cases were presumptively identified as containing cyclopropyl fentanyl by GC/MS. Following validation, the laboratory has identified nine suspected cases of cyclopropyl fentanyl in bio-

Identification of Cyclopropyl Fentanyl in Biological Specimens: Using What Is at Your Disposal *(CONTINUED)*

logical matrices by the LC-MS/MS confirmation method.

With the rapid onset of opioid analogue abuse, it is necessary to utilize all possible methods of detection at a laboratory's disposal. Some analogues do possess cross-reactivity with an ELISA kit, though data for newly emerging drugs is currently limited. GC/MS analysis can provide full scan data but lacks sensitivity, especially at the low concentrations where some analogues demonstrate toxic and lethal levels. Our laboratory recommends extracting the commonly observed 146 and 189 ions as they may indicate the presence of fentanyl or a structurally related analogue. For the case described above, no other drug capable of causing the death of the individual was identified. Extraction of these ions assisted the laboratory in identifying another dangerous analogue impacting our local population. Confirmation by LC-MS/MS provides immense sensitivity with the caveat that what you are attempting to identify must already exist in the validated methodology. By implementing all three instruments in the process of toxicological analysis, a better chance exists to determine what novel substances may be at play in suspected overdoses.

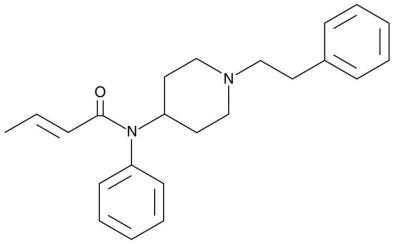
References:

(1) National Institute on Drug Abuse. (2016). DrugFacts: Fentanyl. Retrieved from https://www.drugabuse.gov/publications/drugfacts/fentanyl

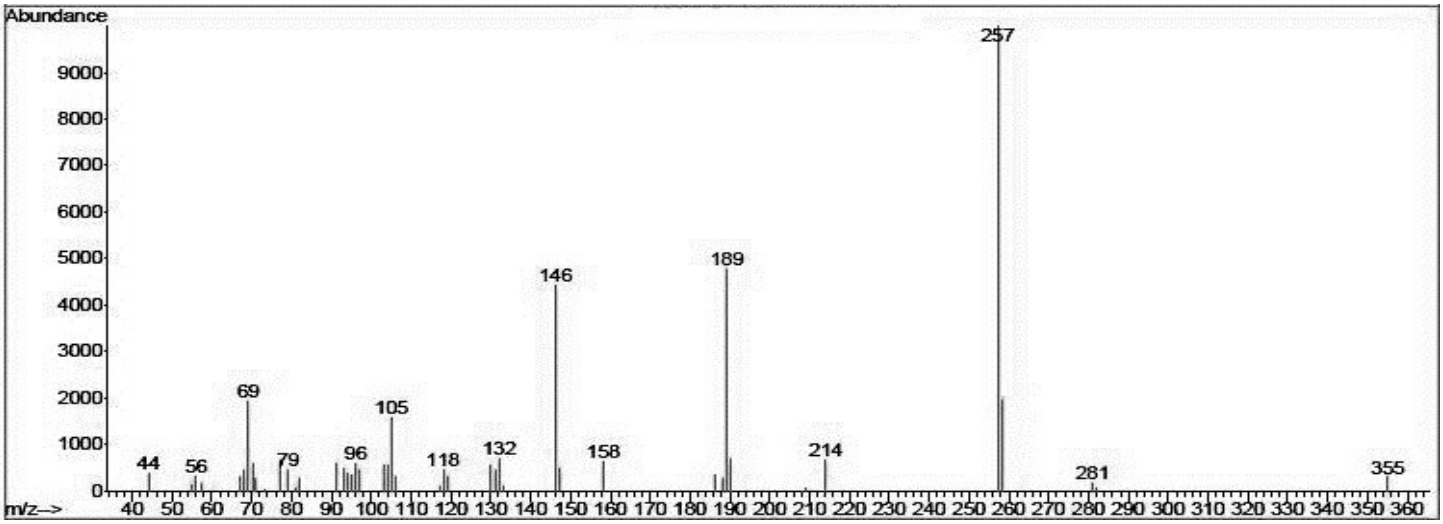
(2) Georgia Bureau of Investigation. (2017). *GBI Crime Lab Identifies Central Georgia Counterfeit Pills* [press release]. Retrieved from https://gbi.georgia.gov/press-releases/2017-06-13/gbi-crime-lab-identifies-central-georgia-counterfeit-pills

(3) D. Cooper, M. Jacob and A. Allen. *Identification of Fentanyl Derivatives*. Journal of Forensic Science, **31** (2), 511 – 528. (1986).

Post-submission Update: After reports surfaced of crotonyl fentanyl demonstrating the same spectrum as cyclopropyl fentanyl, the laboratory obtained a standard from Cayman Chemical. Analysis of crotonyl fentanyl by GC/MS and LC-MS/MS yielded identical retention times, spectra, and transition responses. Our laboratory recommends reporting as cyclopropyl / crotonyl fentanyl unless the compounds can be separated or identified by different methodology (RAMAN, FTIR, etc).



Structure of Crotonyl Fentanyl

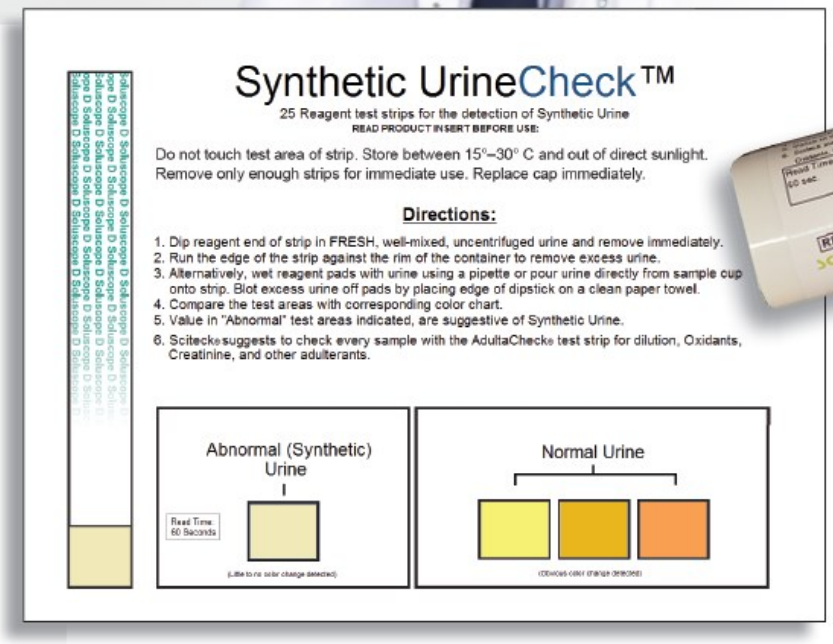


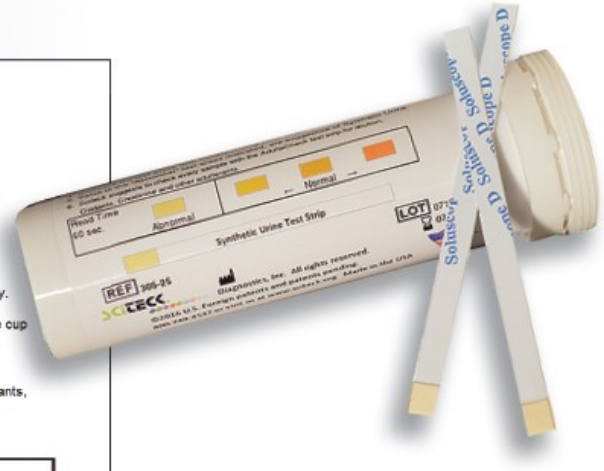
IS IT SYNTHETIC?

Synthetic UrineCheck™

SCITECK. has developed a novel new **on-site test strip** for the detection of synthetic urine submitted for drugs of abuse testing.

This patent pending technology is also available in liquid format for autoanalyzers.





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FROM THE TOXICOLOGY LITERATURE

Submitted by **Kevin G. Shanks, M.S., D-ABFT-FT**
kshanks@axisfortox.com
Axis Forensic Toxicology, Indianapolis, IN

Clinical Toxicology (Philadelphia) Volume 55, Issue 8 Suicide Attempt with Acetonitrile Ingestion in a Nursing Mother

De Capitani *et al*. reported an attempted suicide with the solvent acetonitrile. The subject was a 25 year old female who ingested approximately 157 grams of acetonitrile. She began to feel sleepy and was taken to the hospital. The female was discharged without any other symptoms, but was readmitted to the hospital 20 hours later. Symptoms included hypotension and tachycardia. She was treated over the course of four days with intravenous sodium thiosulfate. Blood and urine samples collected over an eight day period and were analyzed for acetonitrile, cyanide, and thiocyanate. The blood (plasma/serum) sample collected at 24 hours was positive for acetonitrile (200 mg/L), cyanide (146.5 ng/mL), and thiocyanate (38 mg/L). The blood (plasma/serum) collected on day 8 was positive for acetonitrile (17.5 mg/L), cyanide (<LOQ), and thiocyanate (20 mg/L). The subject was asymptomatic after the second day and discharged after the eighth day.

Drug Testing and Analysis Volume 9, Issue 7 Detection of the Designer Benzodiazepine Metizolam in Urine and Preliminary Data on its Metabolism

Kintz *et al*. reported the metabolism and excretion of metizolam. Two milligrams of metizolam was consumed by 54 year old male in a self-administration study. Urine was collected at various time points over six days. Detection of metizolam in urine was completed via LC-MS/MS and LC-QToF. Unchanged drug was detected in urine up to 46 hours. Potential biotransformation products included three monohydroxylated metabolites and glucuronidated metabolites. The authors conclude that metizolam is highly metabolized in humans.

Journal of Analytical Toxicology Volume 41, Issue 5 Clinical Presentation, Autopsy Results, and Toxicology Findings in an Acute N-Ethylpentylone Fatality

Thirakul *et al*. reported the death of a 29 year old male who was found naked wandering along the road in an agitated state. Law enforcement attempted to detain him, but he was combative and was ultimately handcuffed. Emergency personnel administered haloperidol on the scene. While being transported to the hospital he became unresponsive. Resuscitation was performed and a pulse was restored. Upon admission to the hospital, he was hypotensive and tachycardic and hypothermic. Laboratory studies documented elevated troponins, rhabdomyolysis, hypoglycemia, shock liver, acute kidney injury, respiratory failure, and leukocytosis. Over the course of 36 hours he went into cardiac arrest three times. He was pronounced deceased after the third time. At autopsy, pleural and peritoneal effusions, enlarged heart, left ventricular hypertrophy, and cerebral edema were documented. Combined weight of the lungs was 1,780 grams. Toxicological analysis of the admission blood specimen revealed morphine (0.04 mg/L), lidocaine (qualitative), and N-ethylpentylone (qualitative). The cause of death was certified as intoxication by N-ethylpentylone and the manner of death was accident.

Forensic Science International Volume 277 Two Fatalities Associated with Synthetic Opioids: AH-7921 and MT-45

Fels *et al*. reported the deaths of two individuals in 2013 and 2014 that were related to the opioids AH-7921 and MT-45. In the first case a 22 year old woman was found deceased in her bedroom. She was last seen three days prior. A plastic bag labeled AH-7921 was found in the apartment. Cerebral edema and signs of pneumonia were observed during autopsy. Toxicological analysis of femoral blood revealed mirtazapine, methadone, diphenhydramine, tetrazepam, methamphetamine, amphetamine, and AH-7921 (450 mcg/L). Cause of death was attributed to AH-7921. In the second case a 24 year old male was found deceased slumped over a desk. Paraphernalia including an electronic cigarette, e-liquid, spoon, a glass and ascorbic acid stored in a container were found in the room. White powder labeled Methoxphenidine, Methoxmetamine, and MT-45 were also found in the room. Cerebral edema and pulmonary edema were observed at au-

FROM THE TOXICOLOGY LITERATURE *(CONTINUED)*

topsy. Toxicological analysis of femoral blood revealed lidocaine, PB-22, 5F-AKB-47, and MT-45 (660 mcg/L). Cause of death was attributed to MT-45.

Clinical Toxicology (Philadelphia) Article in Press
Recreational Use of Carfentanil – A Case Report with Laboratory Confirmation

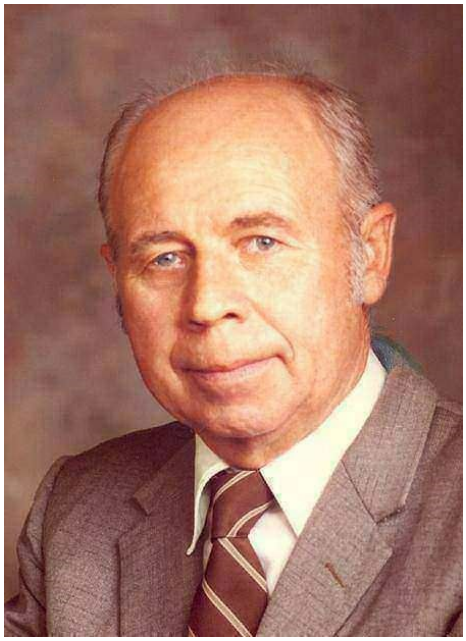
In a letter to the editor, Müller *et al*. reported the case of a 16 year old male who was found unconscious. He was hypotensive, tachycardic, hypopneic, and cyanotic. Naloxone and flumazenil were administered during resuscitative attempts and he was admitted to the hospital. Drug paraphernalia and a white powder were found in his belongings. A serum sample acquired approximately one hour after hospital admission revealed carfentanil (0.6 ng/mL) and norcarfentanil (0.2 ng/mL). The male recovered after hospital treatment and discharged after 24 hours.

Clinical Toxicology (Philadelphia) Article in Press
Fatal Cardiac Glycoside Poisoning Due to Mistaking Foxglove for Comfrey

Wu *et al*. reported the case of a 55 year old woman who presented to the hospital after suffering from nausea, vomiting, weakness, and lightheadedness approximately eight hours after drinking an herbal tea described as comfrey that she had blended herself. During hospital treatment, she became hyperkalemic and developed progressive bradycardia and hypotension. Serum potassium was 6.7 mEq/L and hemodialysis was needed. Toxicological analysis of a serum sample acquired five hours after hospital admission revealed digoxin (151.2 ng/mL). Digibind was given to the patient via infusion over the next several hours. She remained in asystole for thirty hours. She eventually developed acute kidney injury, lower limb ischemia, and multiple organ failure. She died on the seventh day of hospital admission. After death the comfrey tea was identified as *Digitalis purpurea*.

IN MEMORIAM

Walter Hrynkiw , Ph.D., F-ABFT



Walter Hrynkiw, 71, of Wyoming, passed away Monday, May 22, 2017, at his home.

Dr. Hrynkiw was a member of SOFT and a Fellow of the ABFT who frequently consulted on high profile cases nationally. His expertise was highly valued and well known. He also was frequently invited to lecture at schools and conventions.

Prior to his retirement, he was the forensic scientist supervisor at the Pennsylvania State Police Crime Lab Troop P, Wyoming.

Born in Wilkes-Barre, he was the son of the late Walter and Anna Kornowa Hrynkiw. He was a graduate of GAR High School, Class of 1963, Wilkes University with a Bachelor of Science degree in biology and a double doctorate from Temple University in forensics and toxicology.

IN MEMORIAM
Stuart Chapman Bogema Jr. Ph.D., F-ABFT

January 12, 1953 - August 6, 2017

Stuart Bogema died suddenly on Sunday, August 6th, 2017. Stuart has been a long-standing member of SOFT and will be greatly missed. Stuart has served as the Laboratory Director and Responsible Person for two NIDA/ SAMHSA certified drug testing laboratories (AML in Fairfax, VA and ATN in Memphis, TN). He was also an inspector for the SAMHSA National Laboratory Certification Program. Stuart has published over thirty papers and presentations regarding drug testing and toxicology. He has been qualified as an expert in drug testing and forensic toxicology in over one hundred legal proceedings. For the last ten or so years he has extensively researched disposable, non-instrumented immunoassay devices for drug detection and holds a number of patents in that area.

Dr. Bogema obtained a B.S. in chemistry and biology from the University of Richmond and a Ph.D. in pathology and toxicology from the Medical College of Virginia (1993). He went on to obtain an MBA from George Mason University. Dr. Bogema is certified with the American Board of Forensic Toxicology and the American Board of Clinical Chemistry and Toxicological Chemistry.

Stuart met his wife, Connie Slawson, while attending the University of Richmond. They were married for 42 years. Stuart and Connie raised four boys, who are all successful professionals in their own right. Stuart had full life outside of toxicology. He was an avid naturalist who loved being outdoors. He had a passion for music and loved attending musical concerts, particularly the Grateful Dead.

Stuart had a big heart and always had a smile. Those colleagues who knew Stuart knew him as an insightful, hardworking professional. He will be missed.

Ted Shults

Stuart's Facebook page has additional information

IN MEMORIAM
Richard Saferstein, Ph.D.

Richard Saferstein passed away on July 28, 2017. Dr. Saferstein was a SOFT member and a leading national expert and prolific author in the field of forensic science. Dr. Saferstein headed the crime laboratory of the NJ State Police for 21 years until his retirement in 1991. He continued to be a highly sought after consultant, participating in a multitude of high profile cases throughout the country. Dr. Safersteins' books, including the well- known "Criminalistics," continue to be the leading textbook in most forensic science programs in the United States.

Society of Forensic Toxicologists, Inc.

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

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

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juhascmp@gmail.com

TOXTALK® **Deadlines** for Contributions:

February 1 for March Issue

May 1 for June Issue

August 1 for September Issue

November 1 for December Issue

Future SOFT Meeting Destinations:

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

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