

TOXTALK



PRESIDENT'S MESSAGE



ROBERT SEARS, M.S., F-ABFT
SOFT PRESIDENT
rsears@sled.sc.gov

As we prepare to release this edition of ToxTalk, final preparations are underway for the 2022 SOFT meeting to be held in Cleveland, OH. I am extremely encouraged by the high caliber workshops, scientific sessions, and posters that will be presented during the upcoming meeting. There truly is something of interest for everyone.

During my presidency, a recurring theme in my discussions with others has been to encourage members to take advantage of the many opportunities SOFT provides for its members and affiliates. Information provided by our committees, published in ToxTalk, and presented during the annual SOFT meeting contribute to our continued professional development. With guidance from the Continuing

Education Committee and input from our membership, SOFT continues to offer opportunities for continuing education through presentation of various webinars (e.g., Analytical, Interpretive, and Legal Issues Surrounding THC Analogs in DUID Casework and NPS in Combination with Everything). The Publications Committee works diligently with JAT to identify an Editor's Choice article suitable for review and possible continuing education credit.

To experience the full benefits of membership, we must get involved and participate in the activities of SOFT. I challenge each of you to pick an area of the organization that interests you inquire how you might become more involved. If unsure what area interests you the most, start with registering to assist as a volunteer at the upcoming meeting. As we have all heard it said, "many hands make light work". We need many volunteers to make our meeting a success.

I am looking forward to seeing you all in Cleveland.

TOXTALK

TOXTALK® EDITOR
 Robert Johnson, Ph.D., F-ABFT

ASSOCIATE EDITOR
 Chris Heartsill, B.S., D-ABFT-FT

EDITOR EMERITUS
 Yale Caplan, Ph.D., F-ABFT

SECTION EDITORS
 Matthew Barnhill, Ph.D., F-ABFT
 Kevin G. Shanks, M.S., D-ABFT-FT

BOARD OF DIRECTORS

PRESIDENT
 Robert Sears, M.S., F-ABFT

PRESIDENT ELECT
 Erin Spargo, Ph.D., F-ABFT

TREASURER
 Tate Yeatman, M.S., F-ABFT

SECRETARY
 Chris Heartsill, B.S., D-ABFT-FT

PAST PRESIDENT
 Amy Miles, B.S.

DIRECTORS
 Bill Johnson, B.A., D-ABFT-FT
 Philip M. Kemp, Ph.D., F-ABFT
 Madeline Montgomery, B.S., D-ABFT-FT
 Jeri Roper-Miller, Ph.D., F-ABFT
 Andre Sukta, M.S.F.S.
 Madeleine J. Swortwood, Ph.D.

COUNSELORS
 Daniel S. Isenschmid, Ph.D., F-ABFT
 Amanda J. Jenkins, Ph.D., F-ABFT, ABC-GKE

STAFF

EXECUTIVE DIRECTOR
 Beth Olson, MBA

OPERATIONS AND SOCIAL MEDIA MANAGER
 CC Watson

SOFT OFFICE
 1955 W. Baseline Rd., Ste 113-442
 Mesa, AZ 85202
 480-839-9106 info@soft-tox.org

INSIDE THIS ISSUE

PRESIDENT'S MESSAGE	1	INCIDENTS OF TCP IN FORENSIC CASEWORK	25-28
FROM THE EXECUTIVE DIRECTOR'S DESK	2	FROM THE TOXICOLOGY LITERATURE	29-30
TREASURER'S REPORT	3	DRUGS AND DRIVING COMMITTEE	30
ANNUAL MEETING UPDATE	4-13	THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES ...	31-40
YFT COMMITTEE UPDATE	14	BRIEF REVIEW OF XYLAZINE	41-42
2022 ERA AND YSMA RECIPIENT	15-19	DFC SNAPSHOT - ZOLPIDEM	42-46
CAT - OUTSIDE THE TOXBOX	19	IN MEMORIAM	46
MEMBERSHIP	20	FUNDING OPPORTUNITY	47
RTL DEMONSTRATION PROJECT	21	CONTINUING EDUCATION	47
SEEKING MENTORS	22-23	SOFT INFORMATION	48-49
NOMINATING COMMITTEE	24-25		

FROM THE EXECUTIVE DIRECTOR'S DESK



BETH OLSON
SOFT EXECUTIVE DIRECTOR
beth@soft-tox.org

It's hard to believe that we're getting ready to head to SOFT again! It feels like such a short time ago that we were together in Nashville. Registration and hotel room reservations are on track for a pre-2020 meeting attendance of about 1,000 attendees. I'm looking forward to seeing you all there!

CC and I traveled to Denver in July for our first planning visit for the 2023 SOFT meeting at the Gaylord Rockies Resort & Convention Center, along with

local hosts Dan Anderson and Vanessa Beall. We toured the hotel and convention center, met with the staff we'll be working with over the next year, and toured various options for our Wednesday evening off-site event. Dan and Vanessa will be announcing the location of the off-site event in the next issue of ToxTalk – it's going to be one to remember! The Gaylord Rockies Resort & Convention Center opened in 2019 and is located in Aurora, close to Denver International Airport. It's about 10 miles from Downtown Denver, however, the resort has nine restaurants, a water park, and recreational activities on-site including bicycles that can be borrowed, tennis, pickleball and basketball courts, and more. Check it out [HERE](#)

In other exciting meeting news, we have selected Chicago as the location for our 2026 meeting! Our program will be held at the Hilton Chicago, located on Michigan Avenue and overlooking Grant Park, Lake Michigan and the Mu-

seum Campus. The 2026 meeting will be a joint meeting with TIAFT, our first joint meeting since the 2017 meeting in Boca Raton, FL (held in 2018 after we were displaced by Hurricane Irma on our original dates). The meeting hosts for the 2026 meeting are Luke Rodda and Andre Sukta.

We are also excited to announce that the rollout of SOFT's new website, including a members-only area, will begin on December 1, 2022. Please look for more information in your email after SOFT 2022 in Cleveland. The new website will be much easier to navigate and has many more features than our current site.

I hope everyone had the opportunity for some rest and relaxation this summer. See you all in Cleveland!

A handwritten signature of Beth Olson in cursive script.



SOFT 2023

GAYLORD ROCKIES RESORT & CONVENTION CENTER
OCTOBER 29–NOVEMBER 3, 2023
HOSTS: DAN ANDERSON AND VANESSA BEALL

SOFT - TIAFT 2026

HILTON CHICAGO
SEPTEMBER 28 - OCTOBER 2, 2026
HOSTS: LUKE RODDA AND ANDRE SUKTA



2022 TREASURER'S REPORT



TATE YEATMAN M.S., F-ABFT
SOFT TREASURER
YeatmanD@pbso.org

As we approach the end of another summer, I can't help but be a little bit jealous of the crisp cool air that many of you will enjoy very soon. However, those jealous thoughts are fleeting as I look forward to wearing shorts and flip flops throughout the winter months as I observe the snow, ice, and frigid weather from afar. Endless summer suits me.

2022 has been a productive year for the Finance committee in large part to the daily efforts of Executive Director Beth Olson. Since reclassification to a 501c3 organization, steps have been taken to ensure SOFT reaps all the tax savings allowed as a charitable organization, and the Finance Committee has shifted its efforts toward development of an investment strategy for the organization. Earlier this year, the Finance Committee developed an investment policy which has been reviewed and approved by the Board. Currently, we are in the process of identifying an investment firm to manage SOFT's investments. A RFP has been drafted and approved and has been circulated to potential firms.

As the Finance Committee has worked on the 501c3 conversion and investment strategy, the financial health of the organization has been at the forefront of our thoughts. SOFT was able to withstand the financial challenges that COVID presented over the past two years and continues to be in a solid financial position. However, SOFT is not immune to the inflationary pressures that have impacted us all. The task of balancing the SOFT budget has been an increasing

challenge, and inflation is sure to make that task unachievable without either a decrease in member benefits or an increase in membership dues. Neither the Finance Committee nor the Board take any decision to increase dues lightly. The Finance Committee completed a thorough review of the membership benefits and dues for forensic science organizations including AAFS, TIAFT, ASCLD, CAT, and ACS to ensure that members are getting the utmost value for dues compared to these other organizations. This review demonstrated members of SOFT receive exceptional benefits compared to the other forensic organizations while paying significantly lower dues. Membership benefits include, but are not limited to:

1. Journal of Analytical Toxicology subscription: SOFT pays a reduced subscription cost of \$36/year for each SOFT member which is directly paid from membership dues. The regular cost of a JAT subscription to both the printed and online versions is currently \$1310.00/year.
2. Educational Webinars: SOFT offers continuing education webinars throughout the year at a reduced cost to members.
3. Annual Meeting: The Annual Meeting offers a variety of workshops, an exceptional scientific program, and outstanding social events at a reduced cost for members.
4. Membership Directory: With over 1500 entries, the membership directory is a valuable resource for members looking to expand their professional network.
5. SOFT Committees: Members can have a voice in the direction of the organization through service on one of the many SOFT committees.
6. Mentoring Program: The Professional Mentoring Program was launched in January 2020, and provides members with the opportunity to serve as mentors, mentees, or

both to other SOFT members through participation in a guided one-year program.

7. SOFTTopics: SOFTTopics began during 2020's SOFTember as a platform to encourage some social interaction in a very virtual world. This event is an open forum style discussion, where a topic is specified as the focus for a given session.

The Finance committee has recommended the following changes in membership dues to the Board.

1. Increase regular member dues to \$150/year. To reduce the impact of this dues increase, the Board is asking membership for a stepwise increase of \$25/year each of the next two years.
2. Increase student member dues to \$40/year to cover the cost of their JAT subscription.
3. Retired and Emeritus members would no longer receive JAT. If they'd like to continue a JAT subscription, they would pay the \$40/year cost to cover the subscription.

These increases would align SOFT dues with dues for other comparable organizations, ensure the organization can operate with a balanced annual budget, and maintain the financial stability of the organization while maintaining all the benefits members currently enjoy. The membership will be asked to vote on these recommended dues increases at the Annual Business Meeting in Cleveland.

A handwritten signature in black ink that reads "Tate Yeatman". The signature is written in a cursive style.

SOFT 2022 is fast approaching! The Cleveland Planning Committee is putting the final touches on the program. We are working hard to ensure that meeting attendees will benefit from plenty of educational and interactive opportunities. We want first time meeting attendees as well as seasoned ones to learn something new and also have some fun!

The meeting will take place at the Huntington Convention Center, located in the heart of downtown Cleveland. Book your stay at the Hilton Cleveland Downtown or the Cleveland Marriott Downtown at Key Tower. Visit the SOFT website for additional meeting information, <http://soft-tox.org/meeting>

The meeting agenda has been posted and online registration is now open. We have a full slate of abstracts and workshops including **52 oral presentations, 126 poster presentations and 10 workshops**. Thanks to everyone who has submitted their excellent work and research. Plan to attend these abstract presentations and visit the exhibitors. Review the workshop offerings and register now if you haven't already done so.

The **Young Forensic Toxicologists (YFT) committee** has a number of events planned for those who are 40 years old or younger. A YFT Symposium, Professional Development Fair and Student Enrichment Fair will provide great information and a chance to meet your peers.

The week of activities will include a Tuesday evening welcome reception, the Elmer Gordon forum, and a Nite Owl reception. The off-site event is scheduled for Wednesday evening and will take place at the **Rock and Roll Hall of Fame and Museum**, just minutes from the meeting hotels and convention center. Thursday morning starts with the Karla Moore Fun Run. On Thursday evening, plan

to gather at 6:00 pm for a happy hour followed by the **"Red Carpet" President's Banquet** where we will celebrate President Robert Sears. A live band with dancing will be an enjoyable way to end the evening.

East 4th Street, minutes from the meeting hotels, offers world-class dining and entertainment in the heart of Downtown Cleveland. Enjoy several culinary treats from chefs like Michael Symon, Jonathon Sawyer, and Zack Bruell. Enjoy a game with other sports fans and taste some of the best craft brews and drinks the city has to offer. The street is designed for pedestrian traffic only with bowling and arcade games included in the mix of dining choices, <https://www.east4thstreet.com/shop-dine-experience>

There are many other things to see and do in downtown Cleveland and the surrounding area such as the Greater Cleveland Aquarium, Cleveland Museum of Art, Cleveland Museum of Natural History, Great Lakes Science Center, Playhouse Square and the Pro Football Hall of Fame to name a few. Don't forget A Christmas Story House! For ideas on what might interest you, visit <https://www.thisiscleveland.com/things-to-do/major-attractions>

The success of a SOFT meeting involves so many hard working and dedicated members and volunteers. We thank you all, especially the planning committee and the SOFT office staff.

Remember to check out and download the SOFT app to keep track of your activities for the week.

We look forward to seeing you soon in Cleveland!

Doug and Shelly

2022 HOSTS



SHELLY CROSBY



DOUG ROHDE

SCIENTIFIC PROGRAM COORDINATORS
MICHELE GLINN
KIM TOMLINSON

WORKSHOP PROGRAM COORDINATORS
JAYNE THATCHER
NATHALIE DESROSIERS

EXHIBITOR LIAISON
LIZ KIELY

FOOD AND BEVERAGE
ANN MARIE GORDON
DENICE TEEM
DELISA DOWNEY
CARL WOLF

MOBILE APPLICATION
RUSTY LEWIS
ROXANE RITTER
SUNDAY SAENZ

AV COORDINATOR
FRANK WALLACE

VOLUNTEER COORDINATORS
DANIEL BAKER
MATT JUHASICK

FUN RUN COORDINATORS
ERIC LAVINS
KIM YACOB

JAT SPECIAL ISSUE EDITOR
REBECCA HARTMAN

SOFT STAFF
EXECUTIVE DIRECTOR
BETH OLSON
OPERATIONS MANAGER
CC WATSON

OCTOBER 30-NOVEMBER 4, 2022
HUNTINGTON CONVENTION CENTER



ANNUAL MEETING UPDATE - CLEVELAND, OH

IMPORTANT DATES AND DEADLINES

- Registration Deadline to Avoid Late Fee: August 31, 2022
- Registration Deadline to Avoid On-Site Registration Fee: October 10, 2022
- SOFT 2022: October 30-November 4, 2022

[REGISTER HERE](#)

[TRAVEL INFO](#)

[HOTELS](#)

[VOLUNTEERS](#)

[AGENDA](#)

[WORKSHOPS](#)

REGISTRATION PRICING

	Early Bird (June 1 - Aug 31)	Late (Begins Sept 1)	Onsite (Begins Oct 11)
Member	\$599	\$799	\$899
Student	\$299	\$499	\$699
Non-member	\$799	\$999	\$1,099
Exhibitor	\$599	\$599	\$599
Guest (17 and older)	\$499	\$499	\$499
Guest (3-16)	\$299	\$299	\$299
Daily (1 day)	\$299	\$299	\$299
Daily (2 days)	\$599	\$599	\$599
Workshop Only	(workshop fee only)	(workshop fee only)	(workshop fee only)

WORKSHOP PRICING

	Early Bird (June 1 - Aug 31)	Late (Begins Sept 1)	Onsite (Begins Oct 11)
Member Half Day	\$125	\$150	\$175
Member Full Day	\$250	\$275	\$300
Non-member Half Day	\$175	\$200	\$225
Non-member Full Day	\$350	\$375	\$400

2022 HOSTS



SHELLY CROSBY



DOUG ROHDE

SCIENTIFIC PROGRAM COORDINATORS
MICHELE GLINN
KIM TOMLINSON

WORKSHOP PROGRAM COORDINATORS
JAYNE THATCHER
NATHALIE DESROSIERS

EXHIBITOR LIAISON
LIZ KIELY

FOOD AND BEVERAGE
ANN MARIE GORDON
DENICE TEEM
DELISA DOWNEY
CARL WOLF

MOBILE APPLICATION
RUSTY LEWIS
ROXANE RITTER
SUNDAY SAENZ

AV COORDINATOR
FRANK WALLACE

VOLUNTEER COORDINATORS
DANIEL BAKER
MATT JUHASICK

FUN RUN COORDINATORS
ERIC LAVINS
KIM YACOB

JAT SPECIAL ISSUE EDITOR
REBECCA HARTMAN

SOFT STAFF
EXECUTIVE DIRECTOR
BETH OLSON
OPERATIONS MANAGER
CC WATSON

OCTOBER 30-NOVEMBER 4, 2022
HUNTINGTON CONVENTION CENTER



2022 PLANNING COMMITTEE MEMBERS

SOCIAL EVENT AND FUN RUN PRICING

	Early Bird (June 1 - Aug 31)	Late (Begins Sept 1)	Onsite (Begins Oct 10)
Tuesday Welcome Reception	\$150	\$150	\$150
Wednesday Rock & Roll Hall of Fame	\$150	\$150	\$150
Thursday President's Banquet	\$150	\$150	\$150
Thursday Karla Moore Fun Run/Walk (Includes lapel pin & shirt)	\$20	\$20	\$20

REGISTRATION INCLUSIONS

	Scientific Sessions (W,Th,F)	Breakfasts and Refreshment Breaks (W,Th,F)	Lunch (W,Th)	Social Events (T,W,TH)	Abstract/ Program Book	SOFT Bag
Member	X	X	X	X	X	X
Student	X	X	X	X	X	X
Non-member	X	X	X	X	X	X
Exhibitor	X	X	X	X	X	X
Guest	X	X	X	X		X
Daily	X	X	X		X	
Workshop only						

2022 HOSTS



SHELLY CROSBY



DOUG ROHDE

SCIENTIFIC PROGRAM COORDINATORS
MICHELE GLINN
KIM TOMLINSON

WORKSHOP PROGRAM COORDINATORS
JAYNE THATCHER
NATHALIE DESROSIERS

EXHIBITOR LIAISON
LIZ KIELY

FOOD AND BEVERAGE
ANN MARIE GORDON
DENICE TEEM
DELISA DOWNEY
CARL WOLF

MOBILE APPLICATION
RUSTY LEWIS
ROXANE RITTER
SUNDAY SAENZ

AV COORDINATOR
FRANK WALLACE

VOLUNTEER COORDINATORS
DANIEL BAKER
MATT JUHASICK

FUN RUN COORDINATORS
ERIC LAVINS
KIM YACOB

JAT SPECIAL ISSUE EDITOR
REBECCA HARTMAN

SOFT STAFF
EXECUTIVE DIRECTOR
BETH OLSON
OPERATIONS MANAGER
CC WATSON

2022 PLANNING COMMITTEE MEMBERS



OCTOBER 30-NOVEMBER 4, 2022
HUNTINGTON CONVENTION CENTER



ANNUAL MEETING UPDATE - CLEVELAND, OH

**OPENING PLENARY SPEAKER
WEDNESDAY, NOVEMBER 2
8:00-9:00 AM**



JOLENE DEFIORE-HYRMER, MPH

Jolene DeFiore-Hyrmer, MPH is the Bureau Chief of the Bureau of Health Improvement and Wellness at the Ohio Department of Health. As the chief administrator she oversees multiple programs including Chronic Disease Prevention, Chronic Disease Epidemiology and Evaluation, Cancer Prevention and Surveillance, Health Promotion, Tobacco Use Prevention and Cessation, Office of Primary Care, State of Office of Rural Health, and Violence and Injury Prevention and Surveillance. Ms. DeFiore-Hyrmer is the current principal investigator of Ohio's CDC Overdose Data to Action Cooperative Agreement, and has served as principal investigator of multiple grants including Ohio Violent Death Reporting System, the Prevention of Prescription Drug Overdose Program, Enhanced Surveillance of Ohio Opioid-Involved Morbidity and Mortality and the State Core Violence and Injury Prevention Program grants funded through the Centers for Disease Control and Prevention.

Ms. DeFiore-Hyrmer has overseen the implementation of multiple public health surveillance systems and authored multiple surveillance documents. She is also responsible for the implementation of injury prevention projects, including expansion of community-based interventions, Project DAWN (Deaths Avoided With Naloxone), and other initiatives focused on the prevention of injuries. Ms. DeFiore-Hyrmer has served on numerous state committees and advisory groups such as the Ohio Overdose Prevention Network, Second Chance Trust Advisory Committee, Ohio Trauma Committee, and the Recoveryohio Interagency Technical Working Group.

2022 HOSTS



SHELLY CROSBY



DOUG ROHDE

**SCIENTIFIC PROGRAM COORDINATORS
MICHELE GLINN
KIM TOMLINSON**

**WORKSHOP PROGRAM COORDINATORS
JAYNE THATCHER
NATHALIE DESROSIERS**

**EXHIBITOR LIAISON
LIZ KIELY**

**FOOD AND BEVERAGE
ANN MARIE GORDON
DENICE TEEM
DELISA DOWNEY
CARL WOLF**

**MOBILE APPLICATION
RUSTY LEWIS
ROXANE RITTER
SUNDAY SAENZ**

**AV COORDINATOR
FRANK WALLACE**

**VOLUNTEER COORDINATORS
DANIEL BAKER
MATT JUHASICK**

**FUN RUN COORDINATORS
ERIC LAVINS
KIM YACOB**

**JAT SPECIAL ISSUE EDITOR
REBECCA HARTMAN**

**SOFT STAFF
EXECUTIVE DIRECTOR
BETH OLSON
OPERATIONS MANAGER
CC WATSON**

2022 PLANNING COMMITTEE MEMBERS

**OCTOBER 30-NOVEMBER 4, 2022
HUNTINGTON CONVENTION CENTER**



JOIN US AT THE

ROCK & ROLL

HALL OF FAME

11 / 2 / 2022

Enjoy an evening off-site at the Rock and Roll Hall of Fame! Tour the hall at your leisure and enjoy food, beverage, and of course rock and roll. Stop in and get your picture taken at the UCT Photo booth.

PHOTO BOOTH SPONSORED BY:



PLEASE JOIN US FOR

President Sears' Red Carpet Banquet

THURSDAY, NOVEMBER 3

Happy Hour, 6:00-7:00 PM

President's Banquet, 7:00-8:30 PM

Live Band and Dancing, 8:30-12:00 AM



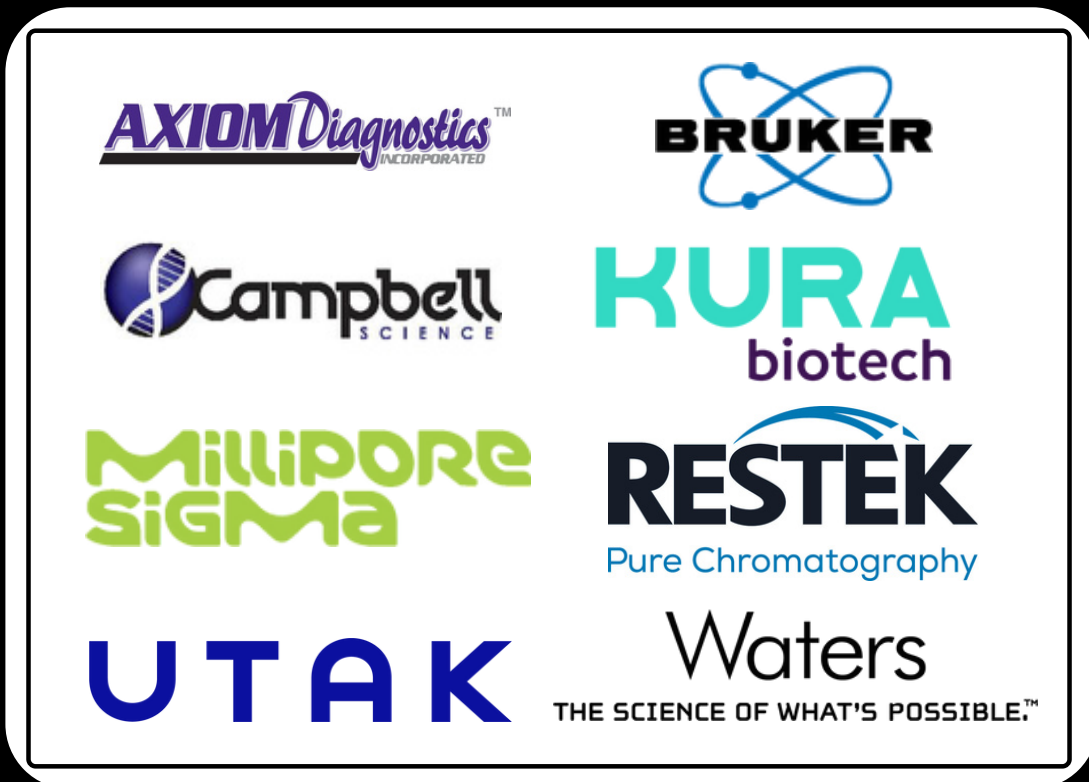
**Enjoy a plated dinner, drinks, and dancing!
Attendees are encouraged to wear cocktail attire
and have their picture taken on the red carpet!**

Hosted at the Hilton Cleveland Downtown

THANK YOU TO OUR SOFT 2022
TIER ONE PLATINUM SPONSORS
\$15,500



TIER TWO GOLD SPONSORS
\$7,500

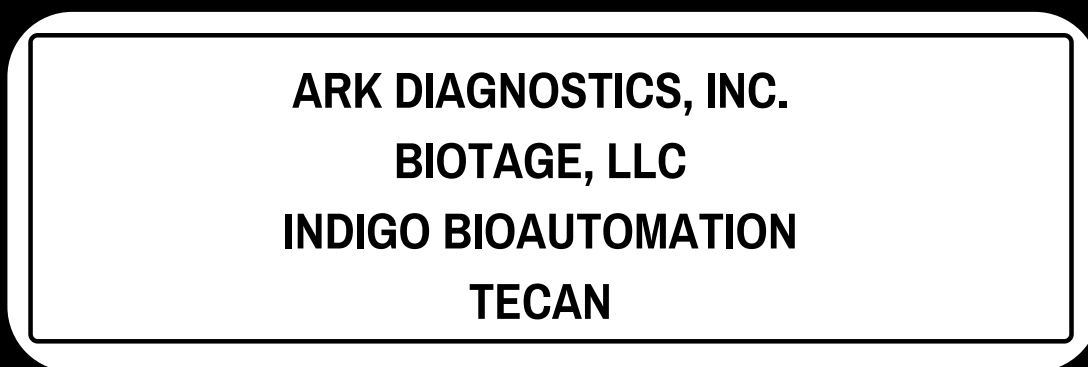


THANK YOU TO OUR SOFT 2022

TIER THREE SILVER SPONSORS \$3,500



TIER FOUR BRONZE SPONSORS \$1,500



TIER FIVE ENTRY SPONSORS \$1,000





LUNCH & LEARN



MONDAY, OCTOBER 31



Agilent



The Power of Precision



Abbott

ThermoFisher
SCIENTIFIC

TUESDAY, NOVEMBER 1



Abbott



Agilent



RANDOX
TOXICOLOGY



The Power of Precision

SHIMADZU
Excellence in Science



Waters
THE SCIENCE OF WHAT'S POSSIBLE.™

LOOK FOR LUNCH & LEARN REGISTRATION INFORMATION IN YOUR EMAIL SOON!

FIRST-TIME ATTENDEE BREAKFAST



Is it your first time attending a SOFT meeting? Wonderful! Join the SOFT Board of Directors at The First-Time Attendee Breakfast. The breakfast will start at 7:00 am on Wednesday, November 2.

THANK YOU TO OUR SOFT 2022 EXHIBITORS!

Abbott
Agilent
Alternative Biomedical Solutions
American Solutions for Business
ANSI National Accreditation Board
ARK Diagnostics, Inc.
Axiom Diagnostics, Inc.
Biochemical Diagnostics/KOVA Intl
Biotage, LLC
Bruker Scientific, LLC
Campbell Science
Cayman Chemical Company
Center for Forensic Science Research & Education
Chrom Tech, Inc.
College of American Pathologists
Clinisys
Data Unlimited International
DPX Technologies
FINDEN Kura
Forensic Advantage
GenTech Scientific LLC
Golden West Diagnostics, LLC
Grenova, Inc.
IMCS
Indigo BioAutomation
INTEGRA
ionBench
JEOL USA, Inc
JG Finneran
JusticeTrax Inc.
LIPOMED
MilliporeSigma
National Forensic Laboratory Information
System
Neogen
NMS Labs
OraSure Technologies
Peak Scientific Inc
PerkinElmer Inc.
Phenomenex
Phytronix Technologies
Randox
Regis Technologies
Restek Corporation
SCIEX
Sciteck Diagnostics
Shimadzu Scientific Instruments, Inc.
Siemens Healthineers
Tecan
Thermo Fisher Scientific
UCT
UTAK
Validity Diagnostics
Waters Corporation

YOUNG FORENSIC TOXICOLOGISTS (YFT)

We are only a few weeks away from the annual meeting in Cleveland, OH and YFT is hard at work putting the final touches on the YFT Symposium, the Professional Development Fair (PDF), and the Student Enrichment Program (SEP)!

The YFT Symposium will be held **Sunday, October 30th from 4:30 – 9:00PM**. This year's event will begin with a social hour that consists of drinks, hors d'oeuvres, and an opportunity for professional networking with peers. During this hour, attendees will also be able to check out the **Professional Development Fair** with representatives from educational programs, professional certifications, and professional organizations available to talk about their offerings. The symposium will continue with presentations from the keynote speaker, **Dr. Teri Stockham**, about the business side of being an expert witness. We will also hear from last year's Leo Dal Cortivo award recipients Sara Walton and Ludmyla Tavares. The evening will include a visit from SOFT's Board of Directors and conclude with an open forum discussion so please bring any questions you may have to discuss with other young forensic toxicologists. We hope to see you Sunday evening!

The **Student Enrichment Program** will be held Monday, October 31st from 8:00AM – 5:00PM. This event is for undergraduate and graduate students interested in learning more about forensic toxicology by hearing from a panel of speakers with a variety of backgrounds. If you are a student and interested in attending, please complete the application found on the SOFT website. (<http://soft-tox.org/yft>).

Abstracts are in! If your abstract was accepted and you marked yourself eligible for the Leo Dal Cortivo award, you will be receiving an email from YFT to submit your application for the award. The applications are due September 20th. Once all applications are in, the committee will review the applications/abstracts as part of the judging process. We look forward to listening to your presentations and discussing your

posters with you! The winner for best poster presentation and best oral presentation will be announced at the end of the meeting.

YFT is excited to host a workshop on testifying, **Good Reputation: The Beginner's Guide to Toxicology Testimony**. This half-day workshop will be on Tuesday, November 1st beginning at 1:30PM. If you feel overwhelmed or nervous about the idea of having to testify, this workshop is for you! Listen to presentations by attorneys and toxicologists about courtroom basics, pre-trial preparation, and presenting toxicology results to a jury. The workshop will conclude with a mock testimony followed by a question-and-answer session. This workshop is perfect for those who have very limited testifying experience and those who have testified countless times that would not mind sharing their experiences in the Q&A session. Keep this workshop in mind when you are registering for the meeting!

We cannot wait to see everyone in Cleveland!



YFT Symposium
Key Note Speaker: Dr. Teri Stockham
October 30, 2022
4:30-9:00 pm



Chair
Amanda Rausch

Vice Chair
Marissa Finkelstein

Secretary
Erin Strickland

Immediate Past Chair
Vanessa Meneses

Members
Whitney Brown
David Cook
Sara Dempsey
Lindsay Glicksberg
Kristin Kahl
Alex Krotulski
Kayla Neuman
Elisa Shoff
Lauren Wolfe

2022 ERA AND YSMA RECIPIENT



**EDUCATIONAL RESEARCH AWARD
ERA-MASTERS
BAILEY JONES**

1. Congratulations on winning this year's ERA/YSMA award! How did it feel when you found out that you had won? **I was excited when I found out I had won because the award actually gives me an opportunity to attend my first scientific conference, which is not something I would have been financially able to do without the award.**
2. When/how did you first learn about SOFT's award program? **I learned about SOFT's award program through my lab team, the Laboratory for Forensic Toxicology Research, at Virginia Commonwealth University in Spring 2022.**
3. Can you briefly explain what your submission was about? **My submission was about developing and validating a unified method for the quantitation of five ethanol metabolites, including EtG, EtS, GTOL, 5-HTOL, and 5-HIAA in urine using UPLC-MS/MS to attempt to correlate these changes in these ethanol metabolites levels with the oral consumption of alcohol.**
4. What did you hope to achieve when you decided to enter a submission to the awards program? **I hoped to win the award and be able to attend SOFT and share my research on a larger stage.**
5. What does it mean to you to receive this award? **This award is a tremendous honor. At the time of applying, I was finishing my Master's research and it was hard to see the reward in the work that I was doing as I was hastily meeting deadlines. This award symbolizes the hard work that I put into this project, as well as the implications it has on the forensic toxicology community.**
6. How did you become interested in forensic toxicology? **I always knew that I liked chemistry but at first, I did not know what avenue I wanted to pursue. During my undergraduate courses, I had realized that I wanted to pursue forensic chemistry because I wanted to dive into the practical applications of chemistry. I obtained my Master's in Forensic Science with an emphasis in drugs and toxicology. While I ultimately chose to pursue drug chemistry over forensic toxicology as my career, I appreciated both avenues of forensic chemistry because of their practical implications and influence on public health.**
7. What continuing education are you currently participating in/taking? **At the time of submission, I was in the process of completing my Master's in Forensic Science with a concentration in Drugs and Toxicology. I graduated in May 2022, and I am currently pursuing a career as a forensic chemist at the DC Department of Forensic Sciences in Washington, DC. I will remain involved with SOFT and AAFS to continue my education in the field and I intend to apply for certification from the American Board of Criminalistics once I meet the minimum experience required to do so.**
8. Tell us about a teacher/mentor that had an impact on you or set you on your present career path? **In high school, my AP chemistry teacher, Mrs. Michele Purrington, convinced me to take her class and made learning chemistry an enjoyable experience. I enjoyed the class so much that I decided to pursue a chemistry major in undergraduate school and the rest was history.**
9. How would you use being the recipient of this award to influence others and how would it impact your career? **As a recipient of this award, I want to say that anything is possible. As an African-American woman, being able to receive this award and use the stage to share my research means the world to me. I hope to inspire others like me to realize that there is a place for us in STEM. As far as my career goes, I aim to continue research and searching for answers to problems, wherever I go.**
10. What advice would you give to future award applicants? **This sounds very cliché, but I would say to believe in yourself. Even if you think that you won't be selected, it is worth applying because you never know what will happen.**
11. Where do you hope to be in 5 years? **I hope to be continuing to make strides within my career. In two years, I intend to apply, and obtain my ABC certification and ideally, in five years, I would like to either advance at the state level or obtain a position at a federal agency.**
12. How do you think the SOFT Awards Program impacts students in Forensic Toxicology? **The SOFT Awards Program, specifically the Educational Research Award, has a tremendous impact on students studying Forensic Toxicology. The awards program not only gives students the opportunity to expand their network, but it allows them to get their foot into the door of the forensic toxicology field.**

2022 ERA AND YSMA RECIPIENT



**EDUCATIONAL RESEARCH AWARD
ERA-DOCTORATE
TYSON BAIRD**

1. Congratulations on winning this year's ERA/YSMA award! How did it feel when you found out that you had won? **It's an incredible honor to receive this award. I was very excited to win, and I felt very grateful that the awards committee felt that I and my research were deserving of this award. It's very validating.**
2. When/how did you first learn about SOFT's award program? **I learned about SOFT's award program at my first SOFT meeting in Grand Rapids.**
3. Can you briefly explain what your submission was about? **There have been an increasing number of adverse events associated with misuse of the atypical antidepressant drug tianeptine when taken in supratherapeutic doses. It is not prescribed in the United States, and its status as a federally uncontrolled opioid has led to its sale as a "nootropic" drug in retail shops. I wanted to use preclinical models of opioid-related adverse effects to characterize the abuse liability of tianeptine as well as its ability to cause respiratory depression and constipation.**
4. What did you hope to achieve when you decided to enter a submission to the awards program? **I was very proud of the work that was submitted for this award, and I was really**

looking forward to the opportunity to present it at SOFT.

5. What does it mean to you to receive this award? **It's an honor to be among the winners of the ERA. The list of prior recipients is full of names of individuals who have been very impactful in forensic toxicology. It's humbling to be the newest entry on that list, and I look forward to growing into the challenge.**
6. How did you become interested in forensic toxicology? **My first real introduction to the subject was a forensic toxicology of alcohol course taught at Wichita State by Dr. Rohrig. It caught my interest, but what really sold me was the forensic toxicology course at VCU taught by Dr. Poklis. Forensic toxicology sits at a really unique intersection of analytical chemistry, pharmacology, public health, and public safety. Every case has unique challenges that keeps the work interesting and engaging.**
7. What continuing education are you currently participating in/taking? **I'm currently finishing up my doctoral dissertation at Virginia Commonwealth University, and I try to supplement my studies with webinars when I have time.**
8. Tell us about a teacher/mentor that had an impact on you or set you on your present career path? **I've been fortunate to have many people who have impacted my life and scientific career, and among them are Michelle Peace, Tim Rohrig, and Justin Poklis. Dr. Peace has been especially encouraging and impactful. I would not have come back to get my Ph.D. without her guidance. I think the most important thing that Dr. Peace has shown me is the impact that we can have on communities and on shaping public policy. Her energy and passion for her work is inspiring.**
9. How would you use being the recipient of this award to influence others and how would it impact your

career? **Being the recipient of this award is a great impetus to continue being involved with SOFT and to contribute back to the forensic toxicology community.**

10. What advice would you give to future award applicants? **I would advise future applicants to keep doing meaningful research, and to keep applying if they don't win the first time.**
11. Where do you hope to be in 5 years? **I've accepted the position of Chief Toxicologist at the Regional Forensic Science Center in my hometown of Wichita, Kansas following the receipt of my doctoral degree. Five years from now, I hope to be leading a team of scientists doing exemplary work in forensic toxicology, and of course presenting that work at SOFT.**
12. How do you think the SOFT Awards Program impacts students in Forensic Toxicology? **I think that the competitive nature of the awards encourages high quality research, and it's very rewarding, as a student, to be recognized by SOFT. Regular attendance at SOFT meetings is important for students for many reasons, and the monetary portion of the award certainly helps to ease the financial burden of the meeting on students. This gives them the freedom to attend SOFT where they can learn, network with others, and advance as forensic toxicologists. The SOFT awards program facilitates students successfully transitioning into their careers.**

2022 ERA AND YSMA RECIPIENT



**YOUNG SCIENTIST
MEETING AWARD
LAERISSA REVEIL**

1. Congratulations on winning this year's ERA/YSMA award! How did it feel when you found out that you had won? **I was shocked and in disbelief which immediately turned into excitement. I also felt an overwhelming sense of pride, especially when I learned that two of my other lab team members Bailey Jones and Tyson Baird from the Laboratory for Forensic Toxicology Research (LFTR) led by Dr. Michelle Peace at Virginia Commonwealth University (VCU) had both won the ERA award at the Master's and Doctoral levels, respectively. This project has taken so much time, energy, and dedication, and I am grateful to have been supported by so many internal and external to this project. It feels wonderful to be recognized for all of my hard work by such a prestigious award and organization.**
2. When/how did you first learn about SOFT's award program? **Amazingly, VCU has a great track record of work that has been recognized by the ERA/YSMA award. Most recently, LFTR's Erica Sales won the ERA award last year, which motivated me to apply this year.**
3. Can you briefly explain what your submission was about? **I have been investigating eutectic mixtures of nicotine and drugs of abuse, spe-**

cifically methadone and cocaine, in the electronic cigarette (e-cigarette). As e-cigarette use increases, the adulteration of nicotine-based e-liquids with drugs other than nicotine has become a more common practice. In a previous study, we examined how the interaction of nicotine and methadone may impact the recovery and dose of the parent drugs, and this time we wanted to investigate whether the trends seen with nicotine and methadone would extend to another class of drug like cocaine.

4. What did you hope to achieve when you decided to enter a submission to the awards program? **I did not expect to be honored with this award as there are many high-caliber entries submitted each year to the SOFT Awards Committee. However, I hoped that if my project was accepted, it would validate how important is the work we are doing and it would raise awareness on the concerns we are trying to tackle. This project highlights the importance of understanding drug potentiation behaviors so that harm reduction strategies can be more adequately identified.**
5. What does it mean to you to receive this award? **It feels amazing. I am honored to be recognized for this award. But it also feels like a great responsibility to uphold the legacies of VCU and SOFT, one that I happily accept.**
6. How did you become interested in forensic toxicology? **My passion for forensic science started long before I knew what forensic toxicology was. My most memorable exposure to forensic science was watching crime scene shows as a kid which inspired me to follow this career path. As I went through my coursework and gained research experience, I started to learn more about drugs of abuse, which prompted this motivation to understand how a drug functions,**

how a drug affects an individual internally and globally, and how legislation affects drug use and how research can affect drug legislation. In learning about these topics, I discovered that I wanted to contribute to answering some of these questions.

7. What continuing education are you currently participating in/taking? **The majority of my continuing education practices are through attending and presenting at educational conferences. Since I have started to attend conferences this past year, I have been able to learn about new and interesting research topics and innovative tools that support forensic toxicology as well as present and share my research. Additionally, attending forensic toxicology webinars have been great opportunities to gain targeted knowledge.**
8. Tell us about a teacher/mentor that had an impact on you or set you on your present career path? **I have many people to thank and that have influenced the trajectory my career will go on. Mentorship is a very powerful tool and having people like Dr. Michelle Peace, Dr. Emanuele Alves, and Dr. Teri Stockham in my mentorship network has been instrumental to navigating my career aspirations, focusing my strengths and highlighting areas I can improve in, and ultimately, motivating me to pursue a PhD, where I will work in the Department of Pharmaceutics at VCU starting this fall. These women have been integral in educating me about the principles of toxicology, but also in helping me develop the tools necessary to be an enterprising woman in this field and discover how I want to contribute to society and Forensic Toxicology.**
9. How would you use being the recipient of this award to influence others and how would it impact your career? **I hope that my receipt of this award will encourage young**

2022 ERA AND YSMA RECIPIENT

scientists, especially from underrepresented populations, to attend a SOFT meeting, to get involved, or to apply for the ERA/YSMA award. Being honored with this award is just the beginning of a long-term dedication and responsibility to create or support initiatives that empower underrepresented populations to be active in this scientific community. The proportion of individuals with my background in forensic toxicology or STEM, as a whole, is extremely limited. I hope throughout my career to participate in goals that aim

to increase diverse perspectives or representation, which will advance the objectives of this organization and, in general, the forensic toxicology field.

That is a great question! Hopefully, I will have finished my doctoral degree. Beyond that, I think the possibilities are endless. I see myself working in a crime laboratory, in industry, or at a federal agency.

10. What advice would you give to future award applicants? **Putting yourself out there and applying for this award may inspire others to apply as well or encourage them to get involved and become a part of this community. And whether you win or not, know that your work matters.**
11. Where do you hope to be in 5 years?

12. How do you think the SOFT Awards Program impacts students in Forensic Toxicology? **Beyond the financial support it provides, it gives students an opportunity to network, to be a part of a community, and to be a part of a legacy.**



**YOUNG SCIENTIST
MEETING AWARD
SARA WALTON**

1. Congratulations on winning this year's ERA/YSMA award! How did it feel when you found out that you had won? **I was very excited and honored to have won the YSMA award this year!**
2. When/how did you first learn about SOFT's award program? **I learned about SOFT's award program from my co-workers and mentors at the Center for Forensic Science Research and Education (CFSRE).**
3. Can you briefly explain what your submission was about? **My submission involved the novel synthetic opioid N-pyrrolidino etonitazene,**

which is a potent synthetic opioid similar to other nitazene analogues (such as isotonitazene and metonitazene) and structurally dissimilar from other synthetic opioids (such as fentanyl and AP-237). This submission describes the pharmacology and toxicology of N-pyrrolidino etonitazene using both in vitro and in vivo methodology. The abstract describes that this was completed using various techniques (i.e., radioligand binding assays, activation potential assays, pharmacodynamic studies, validation of a standard addition quantitation method).

4. What did you hope to achieve when you decided to enter a submission to the awards program? **When I entered my submission to the awards program, I really just wanted to show others the important and exciting research we do at the CFSRE (and with our amazing collaborators) and how much it can impact the field of forensic toxicology.**
5. What does it mean to you to receive this award? **It means the world to me! I am still very early in my career, with only about a year as a full-time forensic toxicologist and only recently graduating with my master's degree. Receiving this award helps me continue to push and strive for**

the best as I continue in my career.

6. How did you become interested in forensic toxicology? **I was always interested in forensic science and once I graduated with my Bachelor of Science in forensic biology, I was able to start working under Dr. Alex Krotulski and with others at the CFSRE, which piqued my interest in forensic toxicology and made me switch gears. I've loved it since then!**
7. What continuing education are you currently participating in/taking? **Recently, I have participated in many analytical courses to increase my knowledge in different instrumentation and different vendor softwares, the most recent being MassHunter courses with Agilent and SCIEX OS demonstrations with help from SCIEX. I am also excited to take part in the Borkenstein Drug course in the fall.**
8. Tell us about a teacher/mentor that had an impact on you or set you on your present career path? **The person who helped (and continues to help) me the most in my career is Dr. Alex Krotulski, my current supervisor at the CFSRE. Since I started working as a forensic toxicologist, and even while still in school, he has been an incredible teacher, passing on all the**

2022 ERA AND YSMA RECIPIENT

knowledge he can and really helping me be the best toxicologist I can be at this stage. I'm excited that I continue to learn from him.

the confidence to strive for more and continue with the research I love doing.

have become well-versed in all the instrumentation that I can so that I will (hopefully) be passing that onto others by that time in my career.

9. How would you use being the recipient of this award to influence others and how would it impact your career? **I would use this award to show others that even though you may have very little experience in the real world or been very recently out of school, you are still capable of making contributions to forensic toxicology and will impact your career in a very positive way! It gives me**

10. What advice would you give to future award applicants? **I would advise future applicants to keep applying for awards and keep pushing with novel research, it is so important to gain all the knowledge we can and help answer the new questions we get asked every day.**

12. How do you think the SOFT Awards Program impacts students in Forensic Toxicology? **I think the SOFT award program has a great impact on students studying forensic toxicology – it helps push students outside their comfort zone to achieve new and exciting research experiences to contribute to the field.**

11. Where do you hope to be in 5 years? **I hope to be continuing in forensic toxicology research and**

CALIFORNIA ASSOCIATION OF TOXICOLOGISTS
presents
"OUTSIDE THE TOXBOX"
Hosted by: Nancy Koshorek & Vanessa Mancoske
Orange County Crime Lab

Date: December 8 & 9, 2022
Hotel: [Hilton Orange County](#)
ABFT Exam
December 7th, 2:30 PM
<https://cal-tox.org>

SOFT MEMBERSHIP

ARE YOU INTERESTED IN MEMBERSHIP? ARE YOU READY TO PROMOTE YOUR MEMBERSHIP?

SOFT is always accepting applications for membership. We offer five membership types; Student, Associate, Full, Emeritus, and Retired. All membership requirements and applications can be found on the SOFT Membership Page below.

MEMBERSHIP BENEFITS

- A mailed print subscription of the Journal of Analytical Toxicology (JAT).
- Reduced registration fees for SOFT's Annual Meeting.
- Reduced registration fees for SOFT webinars.
- FREE participation in the SOFTTopics discussion group.
- Eligible for SOFT committee membership.
- Eligible for participation in SOFT's Professional Mentoring Program.
- Free participation in JAT Editor's Choice continuing education opportunity.

FEE TO APPLY

Your application fee will be transferred to your first annual dues payment once you are approved by the membership committee.

- \$100 for Full and Associate Membership
- \$15 for Student Membership
- \$0 for Retired and Emeritus Membership
- \$0 for Promotion

PROMOTION

If you are currently a member of SOFT and would like to promote to the next membership level, you can do so by completing the Promotion Application [HERE](#). There is no fee to promote your membership, but you will still be responsible for your annual dues payment if you have not already completed it.

MEMBERSHIP COMMITTEE MEMBERS

CHRIS HEARTSILL - CHAIR
KARI MIDTHUN
HEIDI CHRISTENSEN
KATHERINE DOZIER

[LEARN MORE HERE](#)

A WARM WELCOME TO OUR NEW MEMBERS AND CONGRATULATIONS TO OUR MEMBERS THAT HAVE PROMOTED THEIR MEMBERSHIP! WE LOOK FORWARD TO A WONDERFUL 2022 WITH YOU ALL.

ASSOCIATE MEMBERSHIP

YULIYA FROLOVA
SUHASH HARWANI
MELINDA JONES LINS-COMB
GABRIELLE MCCALL
SARAH OLSON
CARLA PEGUESE
VIN PETTY
ZHENQIAN ZHU

EMERITUS MEMBERSHIP

ASHRAF MOZAYANI
ELIZABETH SPRATT

FULL MEMBERSHIP

KRISTOPHER GRAF
KENSON JEAN
ELIZABETH KOGAN
LORNA NISBET
DAN RIOS
JENNIFER SCHUMANN
ERIN TEUTSCH
MARTHE VANDEPUTTE
GRACE WILLIAMS
SAMANTHA WOOTTEN

PROMOTION

SARAH BARTOCK
MARY BOUSCHARD
KELSEY COOPER
FERNANDO MANALOTO
KEI OSAWA
KAYLE SAUNDERS
JESSICA WHITE

STUDENT MEMBERSHIP

ALYSSA AUSTIN
KAITLYN MIZELL
JESSICA OTT
ROCIO POTOUKIAN
GLORIA RAISE

REGIONAL TOXICOLOGY LIAISON DEMONSTRATION PROJECT

RTL REGIONAL TOXICOLOGY LIAISONS

We are only eight months into the project and the Regional Toxicology Liaisons (RTL) have been quite active. They have been engaging the laboratories in their respective regions and working to create a dialogue between the RTLs, labs and partners. In June the RTLs held their first quarterly meetings. Using the first meeting as a framework, future quarterly meetings will follow. The meetings will last about an hour and focus on a topic that is driven by suggestions from the labs. A common issue amongst laboratories of late has been supply shortages. Blood tubes have topped the list but we've also heard about shortages of headspace vials, pipettes and pipette tips, and helium. In response, the SOFT Toxicology Resource Committee created a document to assist laboratories through the supply chain shortages <http://soft-tox.org/blood-tube-shortage>. If your laboratory is experiencing any supply shortages, let us know!

In July, the RTLs were invited to speak at the National Alliance to Stop Impaired Driving (NASID, <https://nasid.org/>) annual conference in Washington DC. This was the first time since the project began that all of the RTLs and I were in the same place at the same time. The meeting was a great success, a lot of networking and knowledge shared amongst highway safety partners.

While the RTLs are currently serving NHTSA Regions 5, 7 and 9, they routinely receive requests for assistance from states that are not included in the project. The requests range from laboratory assistance such as QA/QC, training, method validation and development and supply chain issues to more broad guidance on statutory and policy changes. The RTLs are working hard to provide assistance wherever needed.

The RTLs have received overwhelming feedback for training requests. Most of the training requests have been for toxicology specific courtroom training to include how to stay calm in stressful situations and public speaking techniques. The RTLs are working on a curriculum to meet this need and will be piloting the training at the end of this year. The training requests have also included method validation and development and standards implementation. If you have any specific training requests, we want to hear from you! Please contact us for further discussion.

Amy Miles



- **NHTSA Region 5: Sabra Jones, sabra@soft-tox.org**
- **NHTSA Region 7: Chris Heartsill, chris@soft-tox.org**
- **NHTSA Region 9: Kristen Burke, kristen@soft-tox.org**
- **RTL Project Manager: Amy Miles, amy.miles@slh.wisc.edu**

SEEKING MENTORS

MYTH-BUSTER: MENTORING EDITION

Dispel disinformation, wave away worries, and move away from myths! Here are some common misconceptions about the Professional Mentoring Program and how to work around them.

“I NEED TO BE AT THE TOP OF MY FIELD TO BE A MENTOR.”

No! We welcome all levels of experienced professionals! Mentees are at every career level, and we do our best to match you with someone who will be relatable and accessible.

“I DON’T HAVE ENOUGH TIME TO DEDICATE TO A MENTOR RELATIONSHIP.”

Most mentor relationships commit to a few hours a month or less. This is up to the discretion of both mentor and mentee. Communication is key - by being transparent with each other about your schedule, you’ll be able to find a time that fits. We do understand that, sometimes, things are out of your control; if you need to reassess or take a break, you can always adjust the scheduling.

“MY MENTOR WILL GIVE ME ANSWERS TO THE ABFT EXAM.”

Of course not! But topic discussion and study guide tips are encouraged. Mentors can share strategies that worked for them if they have taken the exam

“I NEED TO KNOW EXACTLY WHAT I WANT OUT OF THE MENTORING RELATIONSHIP.”

Most of us don't know what we really want from a relationship, but by starting one, you are actively engaging with others in the field to widen your network. Common goals from our previous pairs included, but are not limited to: networking, being involved in SOFT, or even to have an outside source to share in the highs and lows of laboratory life.

“I AM ON MY OWN IN THIS MENTOR-MENTEE RELATIONSHIP.”

The mentoring committee has plans to guide the pair throughout the year. We provide webinars, exercises, and resources. We also send reminders and touchpoints to encourage you every month. You are never alone; all of our committee members are there to support and we're only one email/call away!

PROFESSIONAL MENTORING PROGRAM

- Toxicologists at any level of experience
- Application process starts in November and ends mid-December

ONE-ON-ONE CAREER ADVICE
KNOWLEDGE TRANSFER
NETWORKING
SKILLS DEVELOPMENT

NOMINATING COMMITTEE

The Nominating Committee's task is to provide a slate of Officers and Directors to the full membership of SOFT at least 30 days prior to the annual Business Meeting. The President and President-Elect each serve a one-year term, while the Secretary and Treasurer serve a two-year term which expires on alternate years. Directors are elected for a three-year term.

The 2022 SOFT Nominating Committee was comprised of Amy Miles (Chair), Christine Moore, and Bill Anderson. We respectfully submit the following slate to be considered by the SOFT membership. Please see below for Officer and Director bios.

TREASURER: JERI ROPERO-MILLER

DIRECTOR: ROBERT JOHNSON

DIRECTOR: DAYONG LEE



**ROBERT JOHNSON, PH.D., F-ABFT
TARRANT COUNTY
MEDICAL EXAMINER'S OFFICE**

Dr. Robert Johnson joined the Tarrant County Medical Examiner's Office as the Chief Toxicologist in 2011. Prior to joining Tarrant County, he worked for 10 years as a Senior Research Chemist at the Federal Aviation Administration's Civil Aerospace Medical Institute in Oklahoma City, OK. Dr. Johnson is active in SOFT, AAFS, OSAC, and the Southwestern Association of Toxicologists (SAT), he is the current Chair of the OSAC Forensic Toxicology Subcommittee, the past president of SAT, and the immediate

past chair of the National Safety Council's Alcohol, Drugs, and Impairment Division. Within SOFT, he is the current Chair of the Continuing Education Committee, the Co-Editor of ToxTalk, and he serves on the editorial board for the Journal of Analytical Toxicology. Outside of SOFT, he serves on the College of American Pathologists (CAP) Toxicology Committee. He has published 61 scientific articles in his career all of which deal with some aspect of forensic toxicology.



**DAYONG LEE, PH.D., F-ABFT
HOUSTON FORENSIC
SCIENCE CENTER**

Dr. Dayong Lee, F-ABFT, is the manager of the Toxicology section and chief toxicologist at the Houston Forensic Science Center (HFSC). Prior to her tenure with HFSC since 2015, she served as an Intramural Research Program fellow at the National Institute of Drug Abuse conducting her graduate research on cannabinoids and subsequently as a postdoctoral associate of the clinical and forensic toxicology laboratories at the University of Florida. Dr. Lee is certified as a fellow by the American Board of Forensic Toxicology and as a toxicological chemist by the National Registry of Certified Chemists and licensed as a Toxicologist (Interpretive) by the Texas Forensic Science Commission. She serves as a director of the American Board of Forensic Toxicology, a technical assessor for the ANSI National Accreditation Board (ANAB) in the discipline of toxicology, an associate editor for the Journal

of Analytical Toxicology, and a reviewer for multiple journals. She is an active member of the Society of Forensic Toxicologists, currently serving as the Chair of the Drugs and Driving Committee, a member of the Awards Committee, and a moderator for the SOFTopics; she previously served as a member of the Membership Committee and History Committee, as a mentor for the Mentoring Committee and as the 2019 Scientific Program Co-Chair. Additionally, she is a fellow of the American Academy of Forensic Sciences, currently serving as the Co-Chair of the Toxicology section, as well as a member of the International Association of Forensic Toxicologists, the American Society of Crime Laboratory Directors, and the National Safety Council – Alcohol, Drugs and Impairment Division. She received several awards including AAFS Irving Sunshine Award, Young Scientist Award from the International Association of Forensic Sciences, NIH Outstanding Graduate Research, and SOFT Education Research Award. Dr. Lee authored 33 peer reviewed articles and 2 book chapters and presented at national and international professional conferences on diverse topics of forensic toxicology including oral fluid cannabinoids, case reports, drug trends and others. She received a Doctor of Philosophy degree in toxicology from the University of Maryland in Baltimore, a Master of Science degree in forensic science from the University of Illinois in Chicago, and a Bachelor of Science in microbiology and cell science from University of Florida.

NOMINATING COMMITTEE



JERI REPERO-MILLER
RTI INTERNATIONAL

Dr. Jeri Roper-Miller is a Principal Scientist within RTI International's Applied Justice Research Division. With expertise and board certified in the discipline of forensic toxicology, she has published

nationally and internationally on topics of postmortem drug studies, emerging drug threats, hair drug studies, drug surveillance and intelligence, policy and practice research, and technology evaluation and adoption. She is the Program Director for the National Institute of Justice's Forensic Technology Center of Excellence and its Criminal Justice Technology Evaluation Consortium; the current Project Associate Director for the Drug Enforcement Administration-funded National Forensic Laboratory Information System project and the Co-Director for the Bureau of Justice Statistics-funded 2018 Census of Medical Examiners/Coroners' Offices. She received her doctorate in Clinical Chemistry and Forensic Toxicology from the University of Florida

College of Medicine. She currently serves on the Board of the Society of Forensic Toxicologists, the National Institute of Science and Technology's OSAC Forensic Sciences Standards Board, and the editorial boards of the Journal of Analytical Toxicology and Forensic Science International- Synergy. Dr. Roper-Miller is the Past President (2021-2022) of the American Academy of Forensic Sciences and Past Secretary of the American Board of Forensic Toxicology.

INCIDENTS OF TCP IN FORENSIC CASEWORK AND THE NEED TO SCREEN FOR PCP DERIVATIVES

Courtney Wardwell, M.S. and Kevin Schneider, Ph.D.
Virginia Department of Forensic Science
Manassas, VA USA
Courtney.Wardwell@dfs.virginia.gov

Introduction/Background

Phencyclidine (PCP) first appeared as a drug of abuse in the 1960s. Prevalence has fluctuated over the years, but use remains localized to specific metropolitan areas throughout the United States (1). Washington, DC is one of the top regions in the United States for PCP use (2). In the neighboring state of Virginia, PCP accounted for 4.25% of the state's driving under the influence of drugs (DUID) cases in 2021 (unpublished data). Novel psychoactive substances (NPS) containing the PCP core structure have emerged in forensic casework over the last several years (3, 4). Recently, tenocyclidine (TCP), a PCP analog containing a thiophene substitution, has been observed (Figure 1) (5, 6). TCP was first synthesized and reported in patent

literature by Parke-Davis in 1960 (5, 6, 7). TCP is currently a Schedule I drug and produces effects similar to PCP; however, published literature on the effects of TCP is lacking (5, 6, 8). Compared to PCP, TCP has a greater binding affinity at the NMDA receptor (9). Users have self-reported mixed experiences with TCP. Some report that it was "less euphoric" than PCP and "absolutely no fun," while others had "a very good impression" (10–12). Duration of action also seems to differ between users (11, 12). Most agree that TCP is a stronger dissociative than PCP and produces a stronger stimulant effect, with one user saying it "feels like a mix of PCP and methamphetamine" (10, 11). The following report highlights three cases (postmortem, DUID, and drug facilitated sexual assault (DFSA)) where TCP was confirmed in biological specimens

collected from incidents that occurred in Northern Virginia.

Methods

Cases were submitted to the Virginia Department of Forensic Science (VA-DFS) between January 2021 and May 2021. Quantitative values for TCP and PCP were obtained using liquid-liquid alkaline drug extraction per VA-DFS Toxicology Procedures Manual (13). Samples were analyzed using an Agilent 7890A/5975C GC-MS operated in selected ion monitoring (SIM) mode. Three ions were monitored for TCP (m/z 165, 97, 206) and two were monitored for the internal standard, methapyrilene (m/z 97, 191). The dynamic range was 5-200 ng/mL. While the TCP quantitation was not validated to ANSI/ASB

INCIDENTS OF TCP IN FORENSIC CASEWORK AND THE NEED TO SCREEN FOR PCP DERIVATIVES

Courtney Wardwell, M.S. and Kevin Schneider, Ph.D.
Virginia Department of Forensic Science
Manassas, VA USA
Courtney.Wardwell@dfs.virginia.gov

Standard 036 (14), calibrators and controls were prepared daily and the same calibration model was used throughout (weighted linear, 1/x). Therefore, reported concentrations for TCP should be considered semi-quantitative.

Case Studies

Case 1: A 26-year-old female was found submerged in a hotel bathtub. Two glass vials, a carton of cigarettes, and one rolled piece of cigarette paper were found on the bathroom counter. The glass vials were presumed to be PCP based on the decedent's history of PCP use, but were not submitted for testing. Heart blood, liver, and gastric contents were submitted for toxicology. Screening included volatiles, the postmortem toxicology immunoassay panel, an alkaline drug screen, and miscellaneous NPS analysis (for a complete list of what is included in each of these screens, see reference 13). The heart blood contained ethanol (0.020% w/v), methamphetamine (2200 ng/mL), amphetamine (480 ng/mL), PCP (33 ng/mL) and TCP (110 ng/mL). The liver contained methamphetamine (7.8 mg/kg), amphetamine (1.9 mg/kg), PCP (0.15 mg/kg) and TCP (0.37 mg/kg). Gastric contents contained PCP (10 ug/115 g total) and TCP (38 ug/115 g total). The cause of death was determined to be mixed drug intoxication complicated by drowning, and the manner of death was accidental.

Case 2: An officer responded to a vehicle blocking a turn lane into a gas station. When the officer arrived, the car was in the parking lot of the gas station and a 46-year-old male, identified as the driver of the vehicle, was walking away from the car. The officer noted the driver appeared, "disoriented, had the inability to answer questions, had bloodshot eyes, slurred

speech, and was unsteady on his feet." The officer conducted three field sobriety tests on the driver. During the horizontal gaze nystagmus test, the driver had the inability to follow directions provided by the officer; the driver could not keep his head still, nor could he follow the movement with his eyes only. On the walk and turn test, multiple clues were seen including not keeping balance while listening to the instructions, not touching heel-to-toe, using arms to balance, not walking in a straight line, improperly turning, and taking the incorrect number of steps. The driver also turned to the right before completing the first series of steps. After the completion of the second set of steps, he walked backwards. The driver also showed multiple clues during the one leg stand test. He swayed and used his arms while balancing and could not hold his foot off the ground. The driver was placed under arrest and a blood sample was submitted for toxicology. Toxicology screening included volatiles, a DUID immunoassay panel, an alkaline drug screen, and a miscellaneous NPS panel. TCP was found in the blood at a concentration of 7.6 ng/mL. No other substances were detected.

Case 3: A 34-year-old female was allegedly forced to perform sexual acts on a male in a hotel room. Blood and urine were collected 17 h after the incident. The alleged victim reported she experienced lightheadedness, drowsiness, and sedation and that she had one hit of marijuana. Screening analyses were completed for volatiles, the postmortem toxicology immunoassay panel with cannabinoids, alkaline-extractable drugs, acidic/neutral drugs, and miscellaneous NPS. The alleged victim's blood contained tetrahydrocannabinol (THC; 3.5 ng/mL), 11-hydroxy-THC (3.0 ng/mL), 11-nor-9-carboxy-THC (91 ng/mL), and PCP (40 ng/mL). The

urine contained benzoylecgonine (present), PCP (>200 ng/mL), and TCP (15 ng/mL). Cannabinoids were not confirmed in the urine.

Information on an additional nine cases can be found in Table 1.

Discussion

These cases provide insight into TCP concentrations that may be seen in a variety of casework. TCP was generally found in combination with PCP and at estimated concentrations lower than those of PCP. Detection of TCP occurred most commonly in DUID cases, but was also present in postmortem and DFSA cases. Although TCP has since disappeared from casework in Northern Virginia, monitoring for TCP and other PCP-derived NPS may be beneficial in cases where no notable analytical findings are present, or in cases where PCP is indicated in screening. The detection of such derivatives alone or in addition to PCP may provide evidence to support observed user behaviors, standardized field sobriety test performance, or Drug Recognition Expert evaluation patterns. Additional reports describing quantitative results and the effects of PCP-derived substances are needed to add to a body of literature that is currently scarce. In cases where PCP or dissociative anesthetic use is indicated, but reported behaviors are not fully explained by analytical data, screening for TCP and other PCP-derived substances is warranted.

Acknowledgements

The authors would like to thank Dr. Erin Karschner for her considerate thoughts and review and Dr. Melanie Eckberg for her help in obtaining case history and her insight.

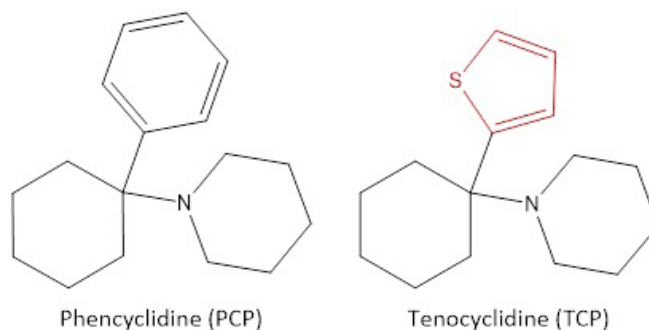
INCIDENTS OF TCP IN FORENSIC CASEWORK AND THE NEED TO SCREEN FOR PCP DERIVATIVES

Courtney Wardwell, M.S. and Kevin Schneider, Ph.D.
Virginia Department of Forensic Science
Manassas, VA USA
Courtney.Wardwell@dfs.virginia.gov

References

1. Substance Abuse and Mental Health Services (2013) The DAWN Report: Emergency Department Visits Involving Phencyclidine (PCP). <https://www.samhsa.gov/data/sites/default/files/DAWN143/DAWN143/sr143-emergency-phencyclidine-2013.pdf> (22 March 2022).
2. Drug Enforcement Administration (2015) 2015 National Drug Threat Assessment Summary. <https://www.dea.gov/sites/default/files/2018-07/2015%20NDTA%20Report.pdf> (8 November 2021).
3. Mitchell-Mata, C., Thomas, B., Peterson, B. and Couper, F. (2017) Two Fatal Intoxications Involving 3-Methoxyphencyclidine. *Journal of Analytical Toxicology*, 41, 503–507.
4. Zidkova, M., Hlozek, T., Balik, M., Kopecky, O., Tesinsky, P., Svanda, J., et al. (2017) Two Cases of Non-fatal Intoxication with a Novel Street Hallucinogen: 3-Methoxy-Phencyclidine. *Journal of Analytical Toxicology*, 41, 350–354.
5. Morris, H. and Wallach, J. (2014) From PCP to MXE: a comprehensive review of the non-medical use of dissociative drugs. *Drug Testing and Analysis*, 6, 614–632.
6. NPS Discovery (2021) Tenocyclidine. https://www.nps-discovery.org/wp-content/uploads/2021/12/Tenocyclidine_121521_CFSRE-Toxicology_Report.pdf (4 March 2021).
7. Parcell, R.F. Patent US2921076 – Heterocyclic compounds and methods for producing the same. <https://patents.google.com/patent/US2921076>.
8. National Archives Code of Federal Regulations. § 1308.11 Schedule I. <https://www.ecfr.gov/current/title-21/chapter-II/part-1308/subject-group-ECFRf62f8e189108c4d/section-1308.11> (17 December 2021).
9. Stirling, J.M., Cross, A.J. and Green, A.R. (1989) The binding of [3H]thienyl cyclohexylpiperidine ([3H]TCP) to the NMDA-phencyclidine receptor complex. *Neuropharmacology*, 28, 1–7.
10. Bluelight. TCP Discussion. <https://bluelight.org/> (22 March 2022).
11. The Hive. TCP Synthesis. <http://chemistry.mdma.ch/hiveboard/methods/000484668.html> (22 March 2022).
12. Reddit. TCP Discussion. www.reddit.com (22 March 2022).
13. Virginia Department of Forensic Science Toxicology Procedures Manual. <https://www.dfs.virginia.gov/wp-content/uploads/220-D100-Toxicology-Procedures-Manual-1.pdf> (22 March 2022).
14. ANSI/ASB Standard O36: Standard Practices for Method Validation in Forensic Toxicology. https://www.aafs.org/sites/default/files/media/documents/O36_Std_e1.pdf (28 March 2022).

FIGURE 1. STRUCTURES OF PHENCYCLIDINE AND TENOCYCLIDINE



INCIDENTS OF TCP IN FORENSIC CASEWORK AND THE NEED TO SCREEN FOR PCP DERIVATIVES

Courtney Wardwell, M.S. and Kevin Schneider, Ph.D.
Virginia Department of Forensic Science
Manassas, VA USA
Courtney.Wardwell@dfs.virginia.gov

TABLE 1. CASE RESULT SUMMARY

Case	Gender	Age	Case Type	Specimen	TCP (ng/mL)	PCP (ng/mL)	Additional Findings
1	Female	26	PM	Heart Blood	110	33	Ethanol, Methamphetamine, Amphetamine
				Liver	0.37 mg/kg	0.15 mg/kg	Methamphetamine, Amphetamine
				Gastic Contents	38 ug/ 115 g total	10 ug/ 115 g total	*
2	Male	46	DUID	Blood	7.6	ND	
3	Female	34	DFSA	Blood	ND	40	THC, 11-OH-THC, THCCOOH
				Urine	15	>200	Benzoylcegonine, Cannabinoids not confirmed
4	Male	39	PM	Femoral Blood	23	140	THC, 11-OH-THC, THCCOOH
5	Male	38	PM	Femoral Blood	26	180	Ethanol, Morphine, 6-AM, Benzoylcegonine, Fentanyl, Acetylfentanyl
6	Male	44	PM	Subclavian Blood	7.8	230	
7	Female	37	DUID	Blood	6.7	56	
8	Male	45	DUID	Blood	23	43	
9	Female	N/A	DUID	Blood	7.8	< 10	
10	Female	N/A	DUID	Blood	5.8	< 10	Nordiazepam, THC, 11-OH-THC, THCCOOH, Benzoylcegonine
11	Female	N/A	DUID	Blood	6	22	THC, 11-OH-THC, THCCOOH
12	Male	23	DUID	Blood	5.4	ND	THC, 11-OH-THC, THCCOOH

6-AM- 6-acetylmorphine; 11-OH-THC- 11-hydroxy-THC; DFSA- drug facilitated sexual assault; DUID- driving under the influence of drugs; N/A- Not available; ND- none detected; THC- tetrahydrocannabinol; THCCOOH- 11-nor-9-carboxy-THC; PM = Post Mortem

Concentrations for TCP and PCP are rounded to two significant figures per VA-DFS reporting guidelines.

*Alkaline drug screen and TCP/PCP quantitation were the only analyses performed

If you have a new article that you'd like to see in FTTL, please send it to kshanks@axisfortox.com

Here are five newly published manuscripts which you may find interesting and helpful to your toxicological investigations.

The First Fatal Intoxication with 3-MeO-PCP in the UK and a Review of the Literature

Journal of Analytical Toxicology

DOI: <https://doi.org/10.1093/jat/bkac015>

Copeland et al. reported the case of a 33 year old man who was found deceased on a farm. He had a history of schizophrenia and bipolar disorder, along with a known history of cocaine, cannabis, and PCP. He also was an avid jogger. At autopsy substance use was detected via a syringe and a packet of white-colored unidentified powder. Femoral blood and urine were drawn and sent for toxicological analyses by LC-HRAM, LC-MS/MS, and GC-FID. Blood was positive for positive for 3-MeO-PCP (estimated to be 31-48 ng/mL), THC-COOH, quinine, and caffeine. Urine was positive for 3-MeO-PCP, O-desmethyl-3-MeO-PCP, N-ethylhexedrone, and caffeine. Cause of death was determined to be phencyclidine use and exercise.

The Blood-To-Plasma Ratio and Predicted GABA-A-Binding Affinity of Designer Benzodiazepines

Forensic Toxicology

DOI: <https://doi.org/10.1007/s11419-022-00616-y>

Manchester et al. reported the blood-to-plasma ratios for six newly

emerged designer benzodiazepines, which include deschloroetizolam, diclazepam, etizolam, meclonazepam, phenazepam, and pyrazolam). Blood-to-plasma ratios were determined to be 0.68 ± 0.06 for deschloroetizolam, 0.82 ± 0.05 for diclazepam, 0.70 ± 0.03 for etizolam, 0.83 ± 0.08 for meclonazepam, 0.57 ± 0.13 for phenazepam, and 1.18 ± 0.03 for pyrazolam. Binding affinity for the GABAA receptor was also predicted by a QSAR model for nine newly reported designer benzodiazepines. The predicted binding affinities ($\log 1/c$) were determined to be 6.8769 for bentazepam, 7.11038 for cinazepam, 10.14 for clobromazepam, 9.16362 for difludiazepam, 10.1289 for flualprazolam, 8.90603 for fluclozepam, 8.3262 for gidazepam, 8.85335 for norfludiazepam, 7.08873 for thionordazepam, and 5.02924 for tofisopam.

Toxicity of Designer Benzodiazepines: A Case of Etizolam and Cocaine Intoxication

Forensic Science International

DOI: <https://doi.org/10.1016/j.forsciint.2022.111324>

Drevin et al. reported the case of a 42 year old man who was admitted to the hospital after experiencing agitation subsequent to use of etizolam and cocaine. Upon admission there were no detectable signs of central nervous system depression – only signs of central nervous system stimulation. Blood was drawn for toxicological testing and etizolam (64 ng/mL), cocaine (<5ng/mL), and benzoylecgonine (10 ng/mL) were detected in the blood plasma. The

authors concluded that the clinical presentation of the individual could not be explained only by the co-consumption of etizolam and cocaine, but hypothesized that the presentation was potentially a paradoxical reaction to high dose etizolam use.

Antemortem and Postmortem Rodenticide Analysis in Forensic Toxicology as a Part of an LC-MS/MS-Based Multi-Target Screening Strategy

Drug Testing and Analysis

DOI: <https://doi.org/10.1002/dta.3222>

Arens et al. reported a procedure of including six common rodenticides (alpha-chloralose, brodifacoum, bromadiolone, coumatetralyl, difenacoum, and warfarin) into an LC-MS/MS multi-target screening assay. The instrument platform used was a Shimadzu HPLC coupled to a Sciex 5500 QTrap mass spectrometer. The method was validated for plasma and postmortem blood and selectivity, linearity, limit of detection, limit of quantitation, imprecision and accuracy, and matrix effects were assessed. No interferences were detected and limits of detection ranged 0.12-0.50 ng/mL. Limits of quantitation ranged 0.48-1.0 ng/mL. Authentic specimens from animals suspected of eating rodenticide baits were used to test the method – alpha-chloralose, brodifacoum, coumatetralyl, difenacoum, and warfarin were successfully detected throughout 7 cases.

The Dark Side of Social Media: Two Deaths Related with Chloroform Intoxication

Journal of Forensic Sciences

FROM THE TOXICOLOGY LITERATURE

SUBMITTED BY KEVIN G. SHANKS, M.S., D-ABFT-FT - AXIS FORENSIC TOXICOLOGY

DOI: <https://doi.org/10.1111/1556-4029.14974>

Tusiewicz et al. reported the unusual case of a potential suicide pact between two 23 year old men who were found deceased in their apartments within a few days of each other. The men, who knew each other via the internet and social media, were found

with either the whole body or head encased in a plastic bag. Sponges were also observed around the mouth and nose. Biological fluids and tissues were taken for toxicological analyses but due to decomposition, no blood and urine could be taken in the second case. In case 1, chloroform was detected in the blood (135.8 µg/mL), urine (16.1 µg/mL), bile (37.1 µg/mL), vitreous humor

(8.1 µg/mL). In case 2, chloroform was detected in kidney (119.5 µg/mL), liver (99.6µg/mL), and muscle (28.4 µg/mL). Both cases were certified as fatal intoxication with chloroform.

SOFT/AAFS DRUGS AND DRIVING COMMITTEE LITERATURE TASK GROUP

SUBMITTED BY SARA DEMPSEY AND NICK TISCIONE

The SOFT/AAFS Drugs and Driving Committee has a Literature Task Group that maintains a list of relevant literature references that are posted to the SOFT website. The intent is to provide a concise resource that can be used for review when preparing for testimony. Members of the task group include Michael Corbett, Sara Dempsey, Rebecca Hartman, Kristin Kahl, Erin Karschner (Chair), Venessa Meneses, Tim Rohrig, Nick Tiscione, and Tate Yeatman. The group performs biannual reviews to evaluate both new and existing articles to ensure the reference list continues to be a valuable resource for toxicologists involved in drug-impaired driving investigations.

The reference list is available in two different formats. The webpage is a concise list of current references http://www.soft-tox.org/duid_literature while the Excel file available for download contains current and archived references http://soft-tox.org/files/Drugs_and_Driving_Literature2022.xlsx Recent updates to the literature list include a new reference for fentanyl by Kiely and Juhascik <https://doi.org/10.1093/jat/bkab08> for tramadol by Nakhaee et al. <https://doi.org/10.1007/s11419-020-00569-0> and updates to the cannabis references.

The group is currently reviewing existing references for Amphetamine/

Methamphetamine/MDMA and will be updating the webpage to focus on Tier I compounds as identified by the National Safety Council's Alcohol, Drugs, and Impairment Division's recommendations for toxicology testing for impaired driving investigations 2021 update <https://doi.org/10.1093/jat/bkab064> To aid in the work of the task group, please submit relevant references for Tier I compounds that may be considered for inclusion to Erin Karschner erin.karschner@gmail.com

SUBMIT TO ERIN KARSCHNER
HERE

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

Designer benzodiazepines (DBZD) is a subclass of novel psychoactive substances (NPS) that has increased in positivity over time. A decade ago, etizolam and phenazepam may have been the DBZDs of concern, but over time, the group has continually expanded. Laboratories are still regularly reporting etizolam, while having to increase the scope of DBZD testing to keep up with the current onslaught of emerging drugs. Bromazolam was detailed in the previous issue as one of the more recent NPS benzodiazepines to emerge onto the recreational drug scene (1). However, in addition to having to increase analytical scopes to cover new drugs such as bromazolam, there is a need to include testing for DBZD metabolites to improve the ability to detect these drugs. In this report, clonazolam and its metabolite 8-aminoclonazolam will be covered in addition to the emerging NPS benzodiazepine 4'-chloro deschloroalprazolam, a positional isomer of alprazolam that poses analytical challenges. Continuous surveillance and method updates are required to properly test for DBZD and fully characterize their prevalence in toxicology samples.

4'-Chloro Deschloroalprazolam

NPS benzodiazepines are a growing class of NPS that continue to appear in toxicological casework and pose challenges for forensic toxicologists, as referenced previously (1). Traditional prescription benzodiazepines are often sold illicitly, and more recently many of these illicitly marketed benzodiazepines contain novel benzodiazepines. A new DBZD was recently identified in postmortem casework in which illicitly manufactured 'Xanax' tablets were found on scene by the Travis County Medical Examiner (Austin, TX): 4'-chloro deschloroalprazolam. This NPS benzodiazepine has the potential to cause identification problems and be misidentified as alprazolam in toxicological casework.

4'-chloro deschloroalprazolam is a 4' substituted NPS benzodiazepine and analogue to the 1,4-benzodiazepine, alprazolam (**Figure 1**). It was patented in 1984 as triazolobenzodiazepine for use as an antihypertensive, but characterization data was not included (2). Most recently, 4'-chloro deschloroalprazolam was identified as the main component in eight capsules seized in December 2021 by the Western Australian Police Force submitted to the ChemCentre for analysis (3).

Likewise, towards the end of 2021, the Travis County Medical Examiner received a postmortem case with illicitly manufactured 'Xanax' tablets found on scene. The case initially screened positive for alprazolam in the femoral blood following an acetonitrile protein precipitation and analysis with a liquid chromatography-quadrupole-time-of-flight (LC-QTOF) drug screen. Subsequently, this specimen was quantified for alprazolam using an alkaline liquid-liquid extraction (LLE) and targeted benzodiazepine scheduled multiple reaction monitoring (sMRM) LC tandem mass spectrometry (MS/MS) analytical method. Upon quantitation of the femoral blood sample, ion ratios would not pass for alprazolam (product ions m/z 281 and 274) despite a high alprazolam concentration (158 ng/mL). The analysis was repeated in the femoral blood and a second femoral blood sample was sent to an outside reference laboratory. Again, ion ratios failed for alprazolam and the reference laboratory could not confirm alprazolam in the second femoral blood sample. Closer inspection of the LC-QTOF data revealed a slight shift in retention time between the case sample and expected retention time for alprazolam (approximately 0.10 min). Utilizing Cayman Chemical's drug identification tool, NPS with the same nominal mass as alprazolam (308.8) were investigated, and a reference standard for 4'-chloro deschloroalprazolam was ordered.

Analysis of the reference standard was performed on the LC-QTOF (Sciex X500R) in electrospray positive ionization mode and data were acquired using information dependent acquisition (IDA), otherwise known as data-dependent acquisition. Full scan MS data were acquired over a mass range of 100-510 Da and MS/MS data were acquired from 25-510 Da, with a ramped collision energy of 35 ± 15 . LC-QTOF analysis of 4'-chloro deschloroalprazolam was compared to an alprazolam reference standard, and the retention time and the mass spectra from the case sample were similar to 4'-chloro deschloroalprazolam (**Figure 2**). The retention time of 4'-chloro deschloroalprazolam was 0.10 min later than that of alprazolam (7.45 min for 4'-chloro deschloroalprazolam and 7.35 min for alprazolam), as was previously observed in the case sample. A mixture of 4'-chloro deschloroalprazolam and alprazolam demonstrated that the two compounds were not chromatographically resolved by the LC-QTOF screen or the targeted benzodiazepine LC-MS/MS quantitation method. The main differences observed between the mass spectra for these compounds included a more abundant 165 ion for alprazolam and a more abundant 131 ion for 4'-chloro deschloroalprazolam (**Figure 2**). The same trend was also observed by Trigg et al. in their recent characterization of 4'-chloro deschloroalprazolam (3). Another subtle difference observed between the two spectra was the difference in ratios of the two major product ions (m/z 281 and 274). A lower signal

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

intensity of the 274 ion present in 4'-chloro deschloroalprazolam resulted in a ratio closer to 20%, compared to alprazolam which exhibited a ratio closer to 30%. This occurrence explains why the case sample continually failed ion ratios for alprazolam.

Once it was established that the case likely contained 4'-chloro deschloroalprazolam, standard addition was utilized to determine the concentration of 4'-chloro deschloroalprazolam in the postmortem femoral and aortic blood using the same alkaline LLE and benzodiazepine LC-MS/MS quantitation method used to quantify alprazolam. Briefly, 20 μ L of internal standard (1 mg/L Alprazolam-D5) was added to 0.5 mL of case sample followed by the addition borate buffer (pH 10) and N-butyl chloride. Samples were capped, rotated for 5 min, and centrifuged at 2500 rpm for 2 min. The organic layer was then transferred to a glass conical tube and evaporated to dryness under nitrogen at 40°C for approximately 30 min. The dried extracts were reconstituted in 75 μ L of mobile phase (80:20; 0.1% formic acid in water: 0.1% formic acid in acetonitrile) and transferred to autosampler vials prior to injection (10 μ L) on the LC-MS/MS (Sciex 3500 QQQ). Linearity (10, 20, 50, 100, 250, and 500 ng/mL), carryover (at 500 ng/mL), and interferences (both endogenous and exogenous) were also evaluated for 4'-chloro deschloroalprazolam, in addition to the standard addition experiments (4, 5). For the standard addition assessments, four aliquots of case sample were evaluated with increasing concentrations of 4'-chloro deschloroalprazolam added to the femoral and aortic blood specimens: one with no up-spike, a 5 ng/mL up-spike, a 50 ng/mL up-spike, and a 500 ng/mL up-spike. Based on the estimated concentration of the case samples, sample dilutions were performed at 2x with drug-free blank blood to preserve the total volume of case specimens. Area ratios at each concentration were plotted to determine the x-intercept/concentration of 4'-chloro deschloroalprazolam in the femoral and aortic blood.

4'-chloro deschloroalprazolam appeared linear from 10-500 ng/mL, with 1/x weighting and a correlation coefficient of 0.9971. No interferences from endogenous matrix components (n=5) or exogenous interferences at 400 ng/mL, including common alkaline and acid/neutral drugs, amphetamines, antidepressants, opiates, and benzodiazepines (excluding alprazolam) were observed. Additionally, no crosstalk between the internal standard and 4'-chloro deschloroalprazolam (500 ng/mL) was observed. Carryover was negligible after the 500 ng/mL calibrator. Based on the results of the standard addition assessment, 4'-chloro deschloroalprazolam concentrations of 160 and 190 ng/mL were obtained from the postmortem femoral and aortic blood samples, respectively. Bromazepam, cocaine and metabolites, THC and carboxy-THC, and ethanol were also found in combination with 4'-chloro deschloroalprazolam.

This is believed to be the first reported postmortem blood concentrations for 4'-chloro deschloroalprazolam. Toxicology laboratories should be aware of the identification problems this alprazolam analogue may cause and the potential to misidentify 4'-chloro deschloroalprazolam as alprazolam. Special attention to chromatographic screening methods is warranted as these compounds may not be chromatographically resolved and awareness of the differences in ion ratios between 4'-chloro deschloroalprazolam and alprazolam is critical to reducing misidentifications.

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

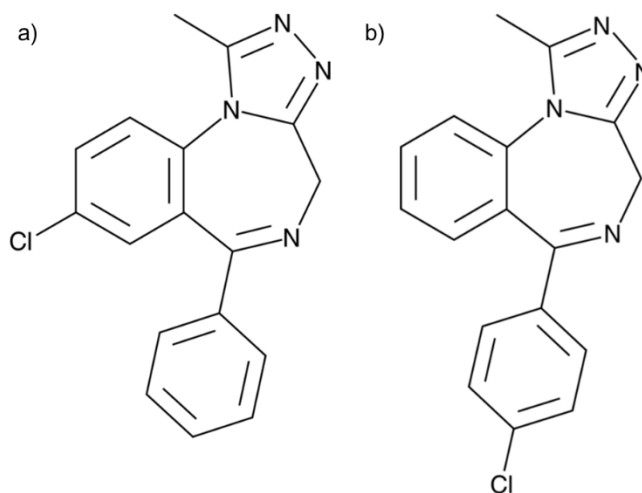
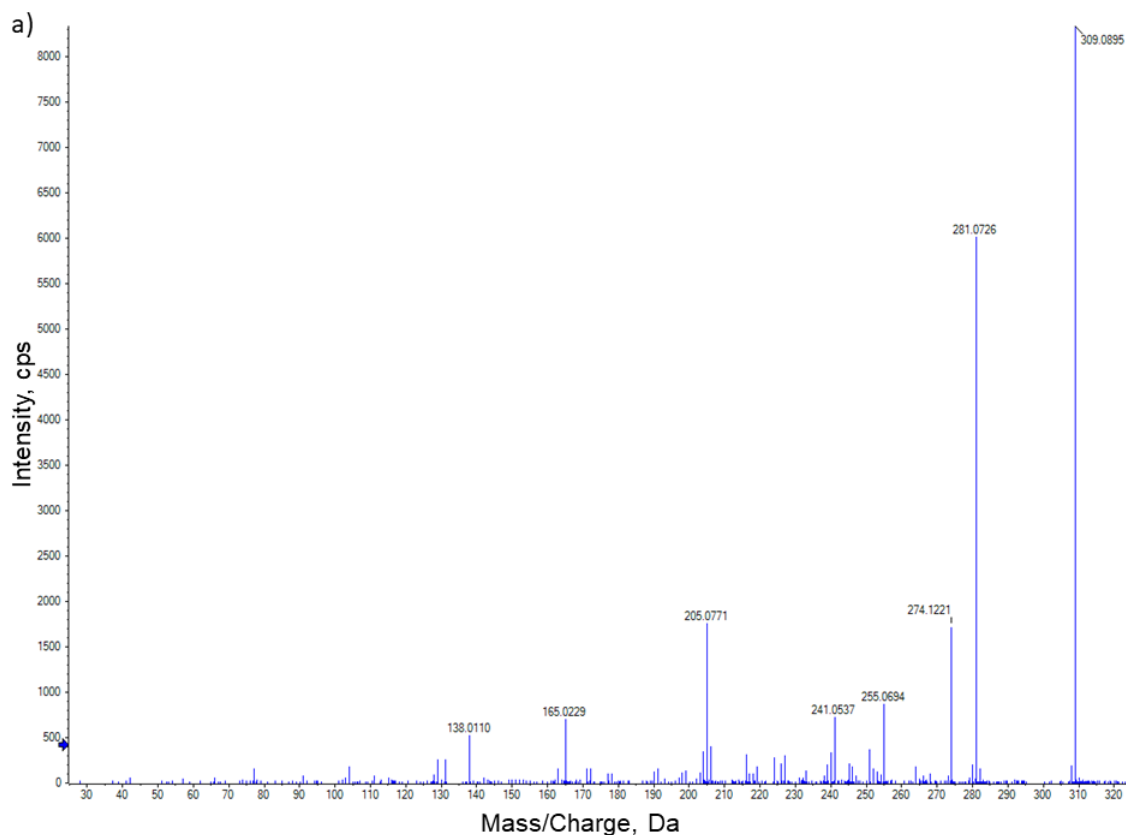


Figure 1: Structure of a) alprazolam and b) 4'-chloro deschloroalprazolam



THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

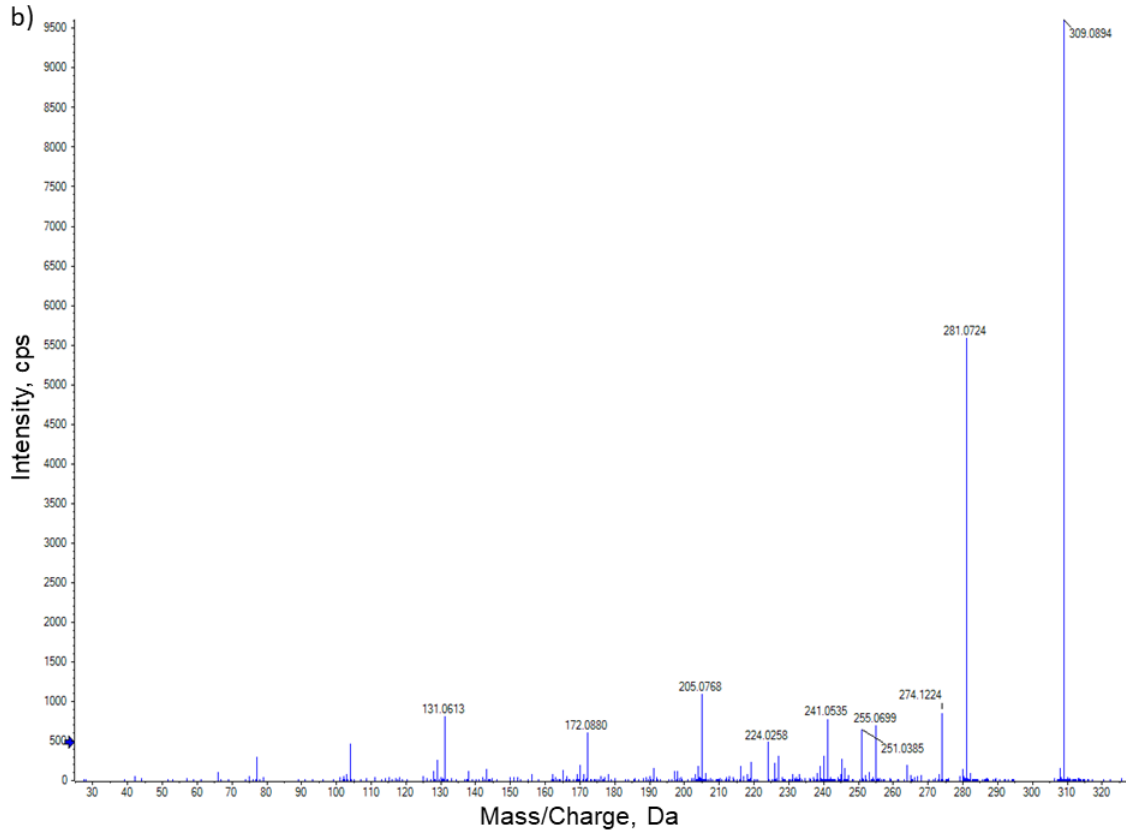
¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA



THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

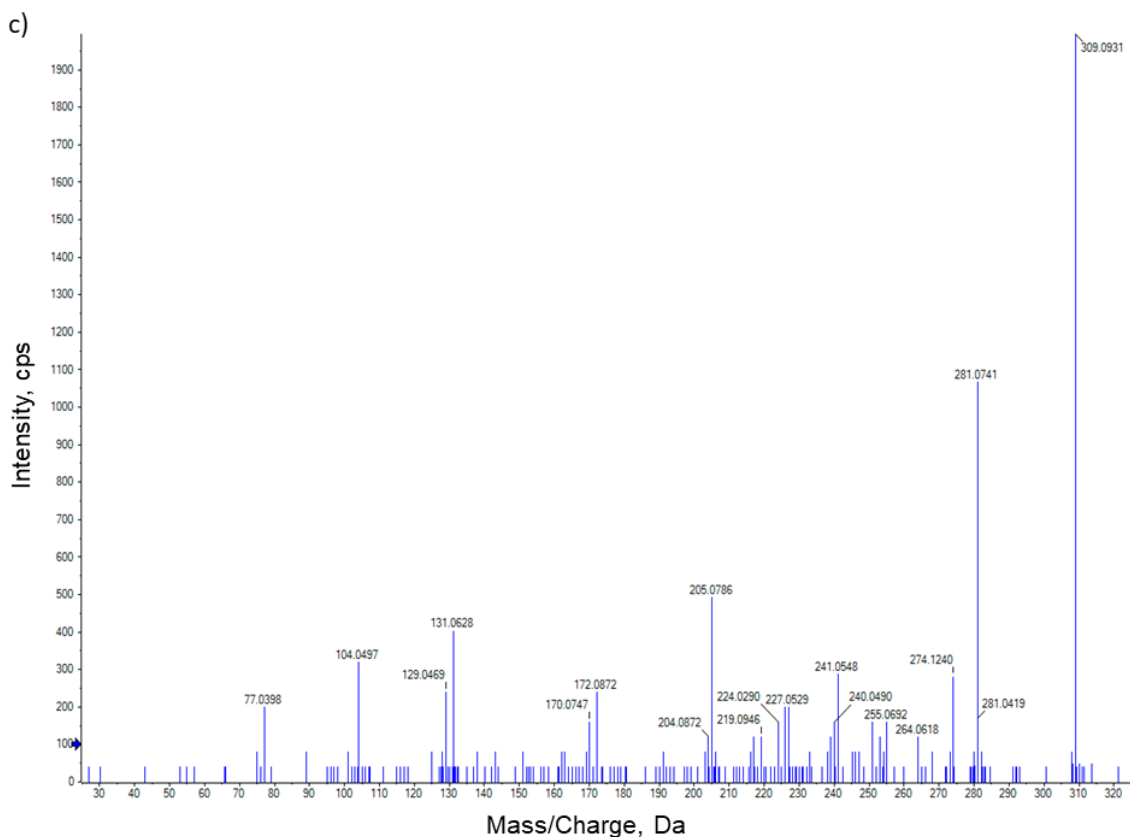


Figure 2: IDA TOF-MS/MS spectra for a) alprazolam reference standard b) 4'-chloro deschloroalprazolam reference standard and c) authentic femoral blood case sample (Precursor 309.1 Da, +1, CE: 35.0)

Formal Name: 6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine

Synonyms: N/A

Structure: Refer to Figure 1

Molecular Weight (Nominal Mass): 308.8 (C₁₇H₁₃ClN₄)

[M+H]⁺: 309.0902

LC-QTOF-MS/MS Spectrum: Refer to Figure 2

[Source: Sciex X500R, Travis County Medical Examiner, Texas, USA]

Pharmacological Drug Class: NPS Benzodiazepine, Central Nervous System Depressant

Suggested LOD: 1-10 ng/mL

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

Clonazepam

Continuing with our previously mentioned list of growing NPS, clonazepam or clonitrazepam, was first reported in 2015 (6, 7). A triazolobenzodiazepine, clonazepam is a potent derivative of clonazepam and alprazolam, and often seen in counterfeit pills sold as diazepam or alprazolam (6, 8, 9). As a benzodiazepine, clonazepam binds to the benzodiazepine receptor site and affects the neurotransmitter GABA. Common effects are sedation, muscle relaxation, and loss of motor control (6). In the United States (US), clonazepam is currently not Food and Drug Administration (FDA) approved and is part of the Schedule I drug list in Oregon, Virginia, and Louisiana. Globally, clonazepam is classified as a Class C drug in the United Kingdom (10) and a controlled substance in some states of Australia (11). Exclusively sold through illicit retailers, clonazepam is commonly found in powdered, blotter, liquid, and tablet formulations (6, 9).

The toxicological analysis for clonazepam follows that of other benzodiazepines with typical analytical instrumentation including liquid-chromatography high-resolution mass spectrometry (LC-HRMS) or LC-MS/MS (12-14). Reporting limits for clonazepam are suggested to be between 1-5 ng/mL, due to low concentrations detected in casework, in addition to limited stability. Average blood concentrations in 22 driving under the influence of drugs (DUID) cases found that clonazepam was detected at 4.1 ng/mL with range from 1.7 ng/mL to 53 ng/mL (13). Clonazepam has an approximate elimination half-life of 3.6 hours, which makes it fall in the category of a short-acting benzodiazepine (12).

Stability experiments for clonazepam have demonstrated a break down by more than 20% in blood over a 6-week study (15). This has implications for detection success and interpretation of results, especially if delays between sample collection and testing are greater than six weeks. Due to the rapid breakdown and the low concentration of clonazepam detected, the metabolite, 8-amino-clonazepam, should be added to screening and confirmation methods (16). Based on the International Union of Pure and Applied Chemistry (IUPAC) rules, the numbering of the amino metabolite of clonazepam is 8-aminoclonazepam, although 7-aminoclonazepam was incorrectly referenced previously as the metabolite of clonazepam (17).

The inclusion of 8-aminoclonazepam with its parent provides a more comprehensive evaluation of the prevalence of clonazepam (18). Reviewing Q1 NPS Discovery trend reports from 2020 to 2022, clonazepam has experienced fluctuating number of detected cases; starting with nine cases in 2020, 71 cases in 2021, and recently, 33 cases in 2022. In comparison, other DBZD flualprazolam, bromazepam, and flubromazepam have seen a steady increase over the last three-quarter reports of 2021 (19).

The first clonazepam case detected at the Orange County Crime Laboratory in California was in September of 2017. In that year, the validation of the LC-QTOF screening method presumptively found flubromazepam in that sample, which prompted a send out to a reference laboratory to confirm the presence of DBZD. Flubromazepam, etizolam, and clonazepam were confirmed in that DUID blood sample.

Following that initial case, the Orange County Crime Laboratory identified 258 clonazepam cases and 153 8-aminoclonazepam cases from 2017 to May 2022. Clonazepam has been steadily rising in this population, with 18 cases in 2018 increasing to 118 cases in 2021. The metabolite, 8-aminoclonazepam, was added to the screening method in May of 2021 and totaled 137 cases that year. Out of the 258 cases, 97.6% of clonazepam positive cases were DUID samples, 1.16% postmortem cases, and less than 1% of other case types. Comparatively, 79.1% of DUID samples also detected 8-aminoclonazepam as well as 16.3% of postmortem samples. The inclusion of 8-aminoclonazepam provide an opportunity for a longer window of detection due to instability and/or other pharmacological factors. Of the 153 cases with 8-aminoclonazepam, 49.7% did not detect clonazepam; with limit of detection for clonazepam at 10 ng/mL. In 2022, case review up to May 2022 suggests clonazepam may be slowing down; so far only four cases detected clonazepam and 16 cases detected 8-aminoclonazepam compared to 118 and 137 cases for all of 2021, respectively.

8-aminoclonazepam was identified in 26 postmortem cases from the Travis County Medical Examiner (Austin, TX) in 2021, and eight postmortem cases in Q1 of 2022. In only two of these cases was clonazepam also identified, further highlighting the need for laboratories to be monitoring 8-aminoclonazepam in addition to clonazepam. The most frequently identified drugs found in combination with clonazepam/8-aminoclonazepam included fentanyl and/or fluorofentanyl (50%), cocaine and metabolites (32%), and metham-

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

phetamine (32%). Additional drug findings included other NPS benzodiazepines (etizolam, flualprazolam, and bromazolam) and heroin (N=4). Alprazolam was only identified in combination with clonazepam/8-aminoclonazepam in 8.8% of cases (N=3); much lower than what was previously observed with bromazolam from 2021 through Q1 of 2022 (47%; 14/30 cases) (1).

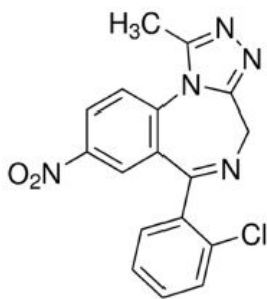
Further work is needed regarding understanding the metabolism and stability of clonazepam. In the 125 postmortem cases and 19 DUID cases reporting 8-aminoclonazepam between March 2021 and June 2022 by NMS Labs, only two cases also reported clonazepam; however, the associated reporting limit for clonazepam is 5.0 ng/mL. The concentrations of the metabolite tend to be higher than the average concentrations reported for clonazepam in the literature. For the 125 postmortem cases referenced above, the average and median blood concentrations were 40 ± 68 and 22 ng/mL, with a range of 2.1-570 ng/mL. For the 19 DUID cases, the average and median blood concentrations were more congruent, at 21 ± 9 and 22 ng/mL, with a range of 5.1-35 ng/mL. In one DUID case, clonazepam and 8-aminoclonazepam were reported at 10 and 35 ng/mL respectively, in addition to 48 ng/mL of flualprazolam.

Inclusion of 8-aminoclonazepam in testing protocols is suggested, as the metabolite increases the detection window for clonazepam and provides a more comprehensive understanding of clonazepam positivity. Further, clonazepam and 8-aminoclonazepam are recommended to both be included in designer benzodiazepine testing along with other drugs of this subclass, as there are frequent reports of multiple designer benzodiazepines being detected together. In nine DUID cases involving clonazepam/8-aminoclonazepam from the South Carolina Law Enforcement Division, eight cases also reported other routinely encountered or novel benzodiazepines; bromazolam, flualprazolam, etizolam, and flubromazolam were also reported in these cases. Constant awareness on new NPS benzodiazepines being introduced to the public will allow toxicology laboratories to stay up to date with current drug trends.

Formal Name: 6-(2-chlorophenyl)-1-methyl-8-nitro-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine

Synonyms: Clonitrazolam

Structure of Clonazepam:



Molecular Weight (Nominal Mass): 353.8 g/mol ($C_{17}H_{12}ClN_5O_2$)

[M+H]⁺: 354.0752

LC-QTOF-MS/MS Spectrum:

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

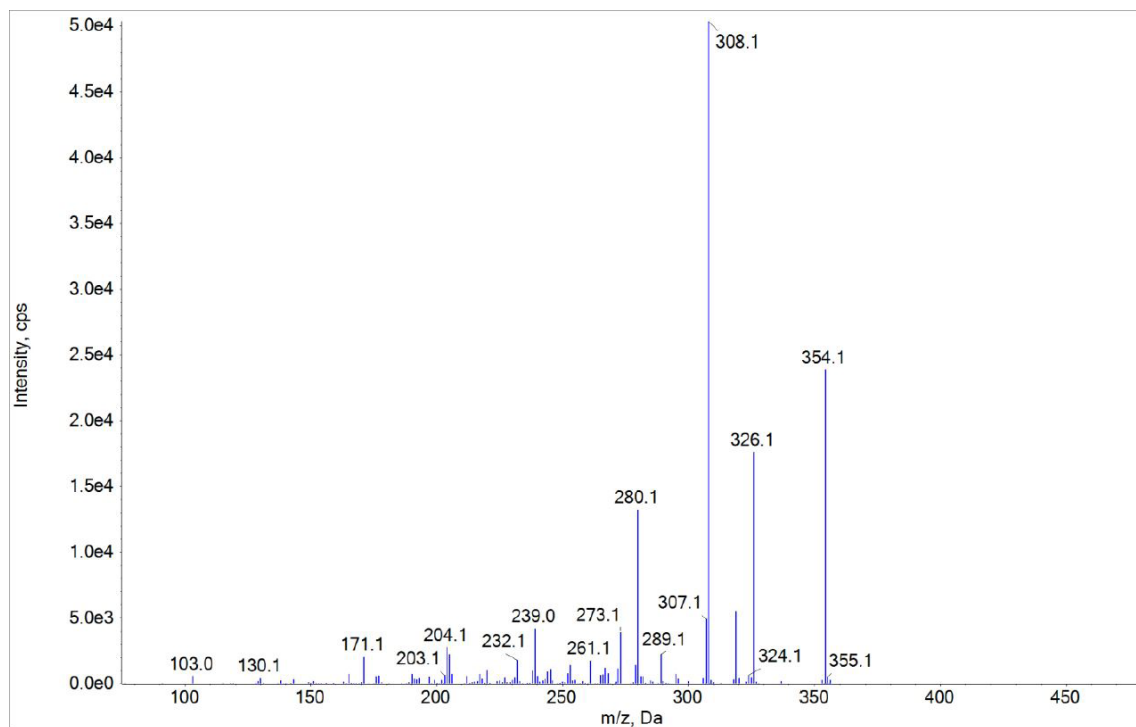
¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA



[Source: Sciex X500R, Orange County Crime Lab, California, USA]

Pharmacological Drug Class: NPS Benzodiazepine, Central Nervous System Depressant

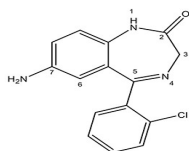
Suggested LOD: <1 ng/mL

Metabolite (8-aminoclonazolam):

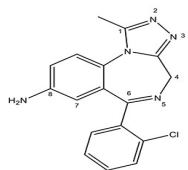
Formal Name: 6-(2-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-8-amine

Structure of 8-aminoclonazolam:

A)



B)



Molecular Weight (Nominal Mass): 323.8 (C₁₇H₁₄ClN₅)

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

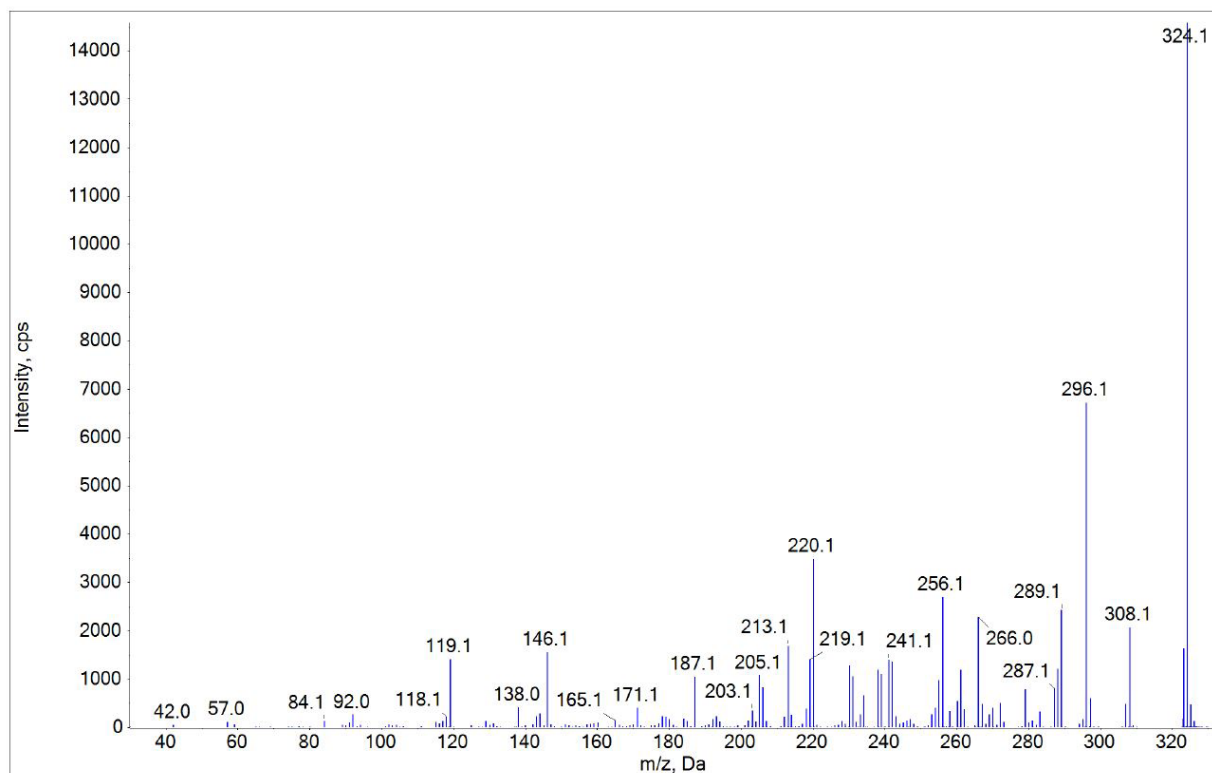
³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

[M+H]⁺: 324.1010

LC-QTOF-MS/MS Spectrum:



[Source: Sciex X500R, Orange County Crime Lab, California, USA]

Suggested LOD: 1-10 ng/mL

Acknowledgements: The authors would like to thank Celia Modell with the South Carolina Law Enforcement Division Forensic Toxicology Department for providing their NPS benzodiazepine data.

References

1. Ellefsen K., Shoff E., Papsun D. (2022) New Drugs on the Block: Spring 2022 Line-Up. *ToxTalk*, 2, 10-17. https://www.soft-tox.org/files/toxtalk/ToxTalk_Issue%202_2022_Final_0.pdf (01 August 2022).
2. Hester Jr JB. (1984) Antihypertensive use of triazolobenzodiazepines, US Patent 1984, US 4455307A. <https://patentimages.storage.googleapis.com/c5/93/83/295c487712bcc0/US4455307.pdf>.
3. Trigg S., Wells JM., McGann J., Bock S., Holman A., Harrison SM., et al. (2022) The alprazolam analogue 4'-chloro deschloroalprazolam identified in seized capsules. *Drug Testing and Analysis*, June 03, 2022: 10.1002/dta.3325.
4. Krotulski AJ., Kacinko S., Homan J., and Logan B. (2021) Quantitative Forensic Toxicology by Standard Addition: Consideration, Experimentation, and Implementation. Presented at the Annual Meeting of the American Academy of Forensic Sciences, Houston, Texas, February 11, 2021.

THE INCREASING SCOPE OF DESIGNER BENZODIAZEPINES: DETAILS ON 4'-CHLORO DESCHLOROALPRAZOLAM AND CLONAZOLAM

Kayla Ellefsen^{1,2}, PhD, Helen Chang³, MS, Elisa Shoff^{2,4}, MS, D-ABFT-FT, Donna Papsun^{2,5}, MS, D-ABFT-FT

¹Travis County Medical Examiner, Austin TX

²SOFT NPS Committee

³Orange County Crime Laboratory, Orange County CA

⁴Miami-Dade Medical Examiner Dept, Miami FL

⁵NMS Labs, Horsham PA

5. Ellison, S.L., and Thompson, M. (2008) Standard Additions: Myth and Reality. *Analyst*, 133(8): 992-997.
6. Cornett, E.M., Novitch, M.B., Brunk, A.J., Davidson, K.S., Menard, B.L., Urman, R.d., Kaye, A.D. (2018). New benzodiazepines for sedation. *Best Practice and Research in Clinical Anaesthesiology*, 32 (2), 149-164.
7. European Monitoring Centre for Drugs and Drug Addiction. (2015) Perspectives on Drugs: The misuse of benzodiazepines among high-risk opioid users in Europe. https://www.emcdda.europa.eu/system/files/publications/2733/Misuse%20of%20benzos_POD2015.pdf. (28 June 2022).
8. World Health Organization. (2020) Critical Review report: Clonazepam, Forty-third meeting, October 2020. https://www.who.int/docs/default-source/controlled-substances/43rd-ecdd/final-clonazepam-a.pdf?sfvrsn=b8b10967_4. (6 July 2022).
9. Welsh Emerging Drugs & Identification of Novel Substance Project (WEDINOS) (2020) Sample results - keyword search 'Clonazepam'. <https://wedinos.org/db/samples/search>. (6 July 2022).
10. The Misuse of Drugs Act 1971 (Amendment) Order 2017 (Legislation.gov.uk), <http://www.legislation.gov.uk/uksi/2017/634/made>. (6 July 2022).
11. "Controlled substances (controlled drugs, precursors and plants) regulations 2014 - Schedule 1". South Australian Current Regulations. http://classic.austlii.edu.au/au/legis/sa/consol_reg/csdpapr2014757/sch1.html. (July 6, 2022).
12. MR van Wijk, X., Yun, C., Hooshfar, S., Arens, A.M., Lung, D., Wu, A.H.B., Lynch, K.L. (2019). A liquid-chromatography high-resolution mass spectrometry method for non-FDA approved benzodiazepines. *Journal of Analytical Toxicology*, 43, 4, 316-320.
13. Heide, G., Høiseth, G., Middelkoop, G., Leere Øiestad, A.M., Blood Concentrations of Designer Benzodiazepines: Relation to Impairment and Findings in Forensic Cases, *Journal of Analytical Toxicology*, 44, 8, 905-914.
14. Puzyrenko, A., Wang, D., Shneider, R., Wallace, G., Schreiber, S., Brandt, K., Gunsolus, I.L., Urine Drug Screening in the Era of Designer Benzodiazepines: Comparison of Three Immunoassay Platforms, LC–QTOF–MS and LC–MS/MS, *Journal of Analytical Toxicology*, 2021;, bkab108.
15. Mehan, J., Flater, M., and Morrison, M. Synthetic benzodiazepines new to Georgia Part 2: analysis and short term stability study. Presented at the annual meeting of the Society of Forensic Toxicologists, Dallas, Texas, October 19, 2019.
16. Pettersson Bergstrand M., Helander A., Beck O. (2016). Development and application of a multicomponent LC-MS/MS method for determination of designer benzodiazepines in urine. *J Chromatogr B Analyt Technol Biomed Life Sci*, 1035, 104-110.
17. Maskell, P.D., Parks, C., Button, J., Liu, H., McKeown, D.A., Clarification of the Correct Nomenclature of the Amino Metabolite of Clonazepam: 8-Aminoclonazepam, *Journal of Analytical Toxicology*, 45, 2, e1–e2.
18. Krotulski, A.J., Papsun, D.M., and Logan, B.K. (2020) Updated Trend Reporting for the NPS Benzodiazepine Clonazepam Based on Data-Mining for 8-Aminoclonazepam. NPS Discovery at CSFRE. https://www.npsdiscovery.org/wp-content/uploads/2020/11/Public-Alert_Clonazepam_NPS-Discovery_110520.pdf. (12 August 2022).
19. Krotulski, A.J., Mohr, A.L.A. and Logan, B.K. (2022) 2022 Q1 NPS-Benzodiazepine Trend Report. NPS discovery at CSFRE. https://www.npsdiscovery.org/wp-content/uploads/2022/04/2022-Q1_NPS-Benzodiazepines_Trend-Report.pdf. (6 July 2022).

BRIEF REVIEW OF XYLAZINE, A DANGEROUS ADDITION TO ILLICIT DRUG MIXTURES

Submitted by: Sruthi Ainapurapu, Sarah B Riley

How could you make the current fentanyl crisis any worse? Start mixing in an animal tranquilizer! That is exactly what's happening with "tranq dope" a new trend adding xylazine to fentanyl and other opioids. Xylazine, a partial alpha-2 adrenergic receptor agonist and analog of clonidine, is approved by the Food and Drug Administration (FDA) for veterinary medicine as a sedative and analgesic to function as an animal tranquilizer⁵. It was not approved for human consumption due to the toxic side effects in humans including lesions of the skin with necrosis, bradycardia, and respiratory depression^{4,5}. Lately, xylazine is being added to drug combinations with opioids, primarily fentanyl, as well as heroin^{2,5} and is sought after for many reasons including the improving euphoria and overall effect time after an opioid injection^{1,5}.

Unfortunately, study of current case trends suggest an increase in the concomitant use of xylazine with opioids. The risk of fatal overdose is becoming an increasing concern in these drug combinations for a few significant reasons. First, xylazine and opioid combinations have synergistic effects that are prolonged and toxic in specific relation to respiratory depression and sedation^{2,4,5}. Second, there seems to be a correlation between xylazine and naloxone resistant overdoses^{1,2,5}. Naloxone has been a leading combatant of the opioid epidemic; however, xylazine is not an opioid. It does not respond to naloxone as intended, so when xylazine is present in combination with opioids, there is a reduction in naloxone effectiveness^{1,2,4,5}. First responders noted that when administering Narcan at scenes, there was a difference in user response as people would only become minimally responsive suggesting the presence of a substance that was not an opioid¹. Yohimbine, an alpha 2 adrenergic receptor antagonist, is used in

veterinary medicine to reverse the effects of xylazine, but yohimbine is not currently being used for this indication in humans.

Xylazine has also been associated with severe skin lesions¹. A 2012 paper reported on the use of xylazine with illicit drugs in Puerto Rico, noting that many of the subjects described in the paper had reported an increase in abscesses, ulcerations, and other skin lesions. The authors postulated that the increase in skin ulceration with xylazine use could be caused by xylazine-mediated deficiencies in skin oxygenation⁶. Since 2012, there reports of such lesions in the lay media, including very recent articles by Vice News^{7,8}.

To date, there is not a great deal of information and knowledge available on xylazine in overdose deaths. Many suggest that there is an underestimation of the extent to which xylazine has permeated the market as xylazine may not be a standard analyte in post-mortem panels, reducing detection during toxicological analysis. Additionally, xylazine isn't currently being tracked nationally^{1,2}. A critical step toward combating this new complication in substance abuse for instituting public safety measures is to understand xylazine's role more thoroughly in the current illicit drug market. This is done by testing for it in any suspected opioid overdose^{1,5}. Other recommendations include health care workers being more readily aware of xylazine toxicity indicators to better identify patients under the influence and more extensive sharing of data on the presence of xylazine within and between jurisdictions in patients as well as drug paraphernalia testing^{2,5}. As xylazine is becoming a drug of serious concern in drug related deaths, it becomes important to look at opioid associated cases and assess how best to handle this shift in the illicit drug market.

References

1. Friedman, J., Montero, F., Bourgois, P., Wahbi, R., Dye, D., Goodman-Meza, D., & Shover, C. (2022, February 26). *Xylazine spreads across the US: A growing component of the increasingly synthetic and polysubstance overdose crisis*. Drug and Alcohol Dependence. Retrieved August 9, 2022, from <https://www.science-direct.com/science/article/pii/S037687162200117X>
2. Kariisa, M., Patel, P., Smith, H., & Bitting, J. (2021). Notes from the Field: Xylazine Detection and Involvement in Drug Overdose Deaths - United States, 2019. *MMWR. Morbidity and mortality weekly report*, 70(37), 1300–1302. <https://doi.org/10.15585/mmwr.mm7037a4>
3. U.S. Department of Health and Human Services. (2022, January 23). *Naloxone for opioid overdose: Life-saving science*. National Institutes of Health. Retrieved August 9, 2022, from <https://nida.nih.gov/publications/naloxone-opioid-overdose-life-saving-science#ref>
4. U.S. Department of Health and Human Services. (2022, June 3). *Xylazine*. National Institutes of Health. Retrieved August 9, 2022, from <https://nida.nih.gov/research-topics/xylazine>
5. *Xylazine: A toxic adulterant found in illicit street drugs*. (n.d.). Retrieved August 10, 2022, from <https://www.nvopioidresponse.org/wp-content/uploads/2020/10/u-public-alert-xylazine-003.pdf>

BRIEF REVIEW OF XYLAZINE, A DANGEROUS ADDITION TO ILLICIT DRUG MIXTURES

Submitted by: Sruthi Ainapurapu, Sarah B Riley

6. Reyes J.C., Negron J.L., Colon H.M., Padilla A.M., Millan M.Y., Matos T.D., Robles R.R. (2012). The emerging of xylazine as a new drug of abuse and its health consequences among drug users in Puerto Rico. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*. 2012; 89(3): 519-526. doi:10.1007/s11524-011-9662-6
7. *Drug users are losing their fingers and toes after shooting "Tranq Dope"*. Krishnan, Manisha, Vice News, March 22, 2022. [Drug Users Are Losing Their Fingers and Toes After Shooting 'Tranq Dope' \(vice.com\)](#)
8. *The future of drugs is a synthetic cocktail from hell*. Krishnana, Manisha, Vice News, May 24, 2022. [The Future of Drugs Is a Synthetic Cocktail From Hell \(vice.com\)](#)

SOFT-DFC SNAPSHOT – ZOLPIDEM

By Marc A. LeBeau, Ph.D., F-ABFT for the SOFT DFC Committee

SOFT-DFC Snapshots are short reports of critical information about the more common drugs associated with drug-facilitated crimes (DFCs). They are not complete literature reviews about the drug or drug class. One key aspect is their focus on the ability to detect a drug after a single-dose administration, as is often the situation in DFC investigations. As such, these summaries also point out instances in which available data is limited in the hopes that this will encourage further research studies. Finally, SOFT-DFC Snapshots point to the use of these drugs in actual DFC cases, as cited in the medical and open literature.

Zolpidem is an imidazopyridine derivative primarily prescribed as a sedative medication for the short-term treatment of insomnia. It has been available in the United States since 1993 and has been suspected or confirmed in numerous DFC investigations worldwide. A 2005 paper declared zolpidem as one of the most frequently used drugs to facilitate sexual assault in Paris and surrounding suburbs.¹ Likewise, a 2015 review of 555 DFSA cases analyzed at the National Forensic Service (NFS) in South Korea between 2006 and 2012 found zolpidem in nearly 6% of the cases.² In contrast, a recent US study found zolpidem in just 0.6% of 1000 cases analyzed over 15 months from March 2015 to June 2016.³

Drug Class: ⁴ Miscellaneous (Sedative-Hypnotic)

Generic Name: Zolpidem

Brand Name(s): Ambien, Ambien CR, Edluar, Intermezzo, Zolpimist

Dosage Forms: Oral tablet (5 or 10 mg); oral tablet, extended release (6.25 or 12.5 mg); sublingual tablets (1.75, 3.5, 5 and 10 mg); oral spray (5 mg per metered spray).⁵

FDA Approval:

Zolpidem is an imidazopyridine derivative with pharmacological effects due to binding to the GABAA receptor. This leads to enhancement of GABAergic inhibition of neurotransmission in the central nervous system, resulting in the CNS depressant effects such as dizziness and drowsiness. It is approved for the treatment of insomnia. Other common side effects include memory loss, anxiety, and abnormal thoughts/behaviors. Complex sleep behaviors (e.g., sleepwalking, sleep-driving, and engaging in other activities while not fully awake) have been reported while using zolpidem.⁶ Combining zolpidem with other CNS depressants (e.g., alcohol, benzodiazepines, opiates, sedative antihistamines, tricyclic antidepressants) results in an increased risk of CNS depression, including an adverse effect on psychomotor performance.⁷

SOFT-DFC SNAPSHOT – ZOLPIDEM

By Marc A. LeBeau, Ph.D., F-ABFT for the SOFT DFC Committee

Metabolism/Elimination: Hepatic metabolism occurs predominantly through CYP3A4 and to a lesser extent by CYP1A2 and CYP2D6, producing two primary, inactive urinary metabolites: zolpidem phenyl-4-carboxylic acid (metabolite I) and zolpidem 6-carboxylic acid (metabolite II).⁸ Metabolite I represents about 33-50% of the parent drug, while metabolite II accounts for about 6-10%.^{9,10} The average elimination half-life of zolpidem ranges between 2 to 3.5 hrs.^{5,7,11,12} It is noted that this may be extended for females, so lower doses are recommended to avoid prolonged impairment.^{13,14} Extended elimination half-lives may also be observed in the elderly, where the half-lives may be about 32% longer with some formulation types.^{7,15}

Single Dose Studies:

Urine:

The SOFT DFC Committee⁴ and the AAFC Standards Board¹⁶ have established the importance of testing urine samples from alleged victims of drug-facilitated crimes for zolpidem's primary urinary metabolite, zolpidem phenyl-4-carboxylic acid (metabolite I), at a decision point concentration of 10 ng/mL or lower. Urine is easily collected, straightforward to analyze, and provides a longer window of detection of zolpidem ingestion compared to blood.

There are limited single-dose studies of zolpidem with measurements made in urine specimens over time. In one study, three volunteers were administered a 10-mg oral dose of zolpidem and then provided urine specimens every 12 hrs. afterward up to 144 hrs.¹⁷ With the author's LC-MS/MS method and a reported detection limit of 0.01 ng/mL, they were able to detect the single exposure of the parent drug zolpidem for up to 60 hr. in urine, with the largest concentrations (5-25 ng/mL) appearing in the first 12 hr. specimen after administration. The authors did not look for zolpidem metabolites in this study.

A 2012 study involved four Chinese subjects administered a single 10-mg oral dose of zolpidem.¹⁸ The highest urinary concentrations for zolpidem (about 250 ng/mL) occurred at 4 hrs. post-administration. Likewise, the highest concentration of zolpidem metabolite II was 200 ng/mL at the 4-hr. collection. However, zolpidem metabolite I did not reach its maximum concentration (550 ng/mL) until 8 hrs. after ingestion.

Blood/Plasma/Serum:

Blood, plasma, and serum specimens allow for more meaningful quantitative assessments of positive findings; however, zolpidem and its metabolites may no longer be detectable if these specimens are collected more than 8-12 hrs. after the alleged ingestion of a single dose.

Peak plasma concentrations in healthy adults following oral administration of 5 or 10 mg conventional zolpidem tablets averaged 59 (range: 29-113) and 121 (range: 58-272) ng/mL, respectively, at a mean time (T_{max}) of 1.6 hours for both.⁵

In another study, single oral 12.5 mg extended-release zolpidem tablets found an average peak plasma concentration of 134 ng/mL occurring at a T_{max} of 1.5 hours.¹⁹

3.5 mg sublingual zolpidem tablets administered to fasting young adults resulted in a peak plasma concentration of 57 ng/mL at a T_{max} of 0.9 hours.¹¹ Others have reported that the T_{max} ranges between 30-180 minutes, with a median time of 82 minutes for some sublingual formulations.⁵

Zolpidem oral spray is quickly absorbed from the oral mucosa and GI tract resulting in a T_{max} that is under 1 hour.⁵

SOFT-DFC SNAPSHOT – ZOLPIDEM

By Marc A. LeBeau, Ph.D., F-ABFT for the SOFT DFC Committee

Hair:

Hair allows for the longest window of detection for zolpidem. Still, it comes with the disadvantage of being more difficult to analyze, the requirement of methods about 1,000-1,000,000 times more sensitive than what is needed for analyzing blood or urine, and the general inability to differentiate ingestions from one week to the next.

Shima et al. developed a sensitive LC-MS/MS procedure (LOD: 50 fg/2-cm of a single hair) to analyze single hairs collected from a volunteer after ingestion of a single 10-mg dose of zolpidem.²⁰ 14 of the 15 hairs collected 67 days after ingestion had detectable amounts of zolpidem in the first 2-cm of the single hairs estimated to average 43 pg (range: 27-63 pg).

Another study used an LC-MS/MS method to analyze hair specimens from three volunteers collected 3-5 weeks after ingestion of a single 10 mg dose of zolpidem.¹⁷ Zolpidem was detected in the hair specimens at concentrations ranging from 2 to 10 pg/mg.

Remarkably higher concentrations were reported in another study.²¹ Hair collected from 20 Chinese volunteers one month after administration of a single 10-mg dose of zolpidem found zolpidem concentrations ranging between 135-555 pg/mg in the first 2-cm segments of hair.

DFC Cases:

A 2004 publication reported a young, hospitalized female who was offered a coffee by a male nurse and subsequently went unconscious. As she regained consciousness, she realized she was being sexually assaulted; however, she did not report this to the police until 6 days later. A hair specimen was collected 15 days after the alleged offense and was found to contain unprescribed zolpidem in the first 2 cm segment.¹⁷

One of the most high-profile cases involved an American NFL star – Darren Sharper – who was accused of raping numerous women from 2011 to 2014 in different states while either drugged or unconscious.^{22,23} Zolpidem was one of the drugs that Sharper was accused of and later admitted to, surreptitiously administering to his victims.^{22,24} Two co-conspirators in the Louisiana crimes also pleaded guilty to using zolpidem in those rapes.²⁵

A 2012 study reported a girl drinking a soft drink offered by a young man at a party.¹⁸ After consuming the drink, she became unconscious. Approximately 16 hours later, she woke up and realized she had been sexually assaulted. After reporting the assault to the police, she had blood and urine collected at the hospital (approximately 20 hours after the assault). Zolpidem metabolite I was found at 10 ng/mL in the victim's blood specimen, but zolpidem and zolpidem metabolite II were not detected. Zolpidem and both metabolites were identified in the urine specimen.

In 2014, a Houston businessman admitted using zolpidem to drug a female employee while traveling together on a business trip. While unconscious, he took photographs of her nude body and attempted to commit a drug-facilitated sexual assault.²⁶

In 2016, a 56-year-old female claimed to have been sexually assaulted by a group of five men (employees of the hotel where she was staying) after consuming an alcoholic drink offered by one of them. Three urine specimens were collected at 38, 44, and 45 hours after the assault, and a hair sample was collected seven months later. Although the urine specimens were tested following SOFT recommendations, no drugs were detected. However, zolpidem and two other CNS depressant drugs (flunitrazepam and oxazepam) were detected in the hair sample. The reported zolpidem concentration ranged between 0.7 to 1.1 pg/mg in different hair segments.²⁷

SOFT-DFC SNAPSHOT – ZOLPIDEM

By Marc A. LeBeau, Ph.D., F-ABFT for the SOFT DFC Committee

References:

1. Chèze, Marjorie, et al. "Hair analysis by liquid chromatography-tandem mass spectrometry in toxicological investigation of drug-facilitated crimes: Report of 128 cases over the period June 2003–May 2004 in metropolitan Paris." *Forensic Science International* 153.1 (2005): 3-10. <https://doi.org/10.1016/j.forsciint.2005.04.021>
2. Choi, Hyeyoung, et al. "Epidemiological Analysis and Toxicological Findings of Drug Facilitated Sexual Assault Cases." *Yakhak Hoeji* 59.5 (2015): 230-234. <https://doi.org/10.17480/psk.2015.59.5.230>
3. Fiorentin, Tais Regina and Barry Kerr Logan. "Toxicological findings in 1000 cases of suspected drug facilitated sexual assault in the United States." *Journal of Forensic and Legal Medicine* 61 (2019): 56-64. <https://doi.org/10.1016/j.jflm.2018.11.006>
4. "[Recommended Minimum Performance Limits for Common DFC Drugs and Metabolites in Urine Samples](#)". SOFT Drug-Facilitated Crimes Committee, Society of Forensic Toxicologists. June 2017. Retrieved March 24, 2022.
5. "[Zolpidem Tartrate – Drug Summary](#)". Prescriber's Digital Reference. PDR.net. Retrieved March 24, 2022.
6. "[Ambien](#)". Sanofi-Aventis. Ambien.com. November 2019. Retrieved March 24, 2022.
7. "[Zolpidem Monograph for Professionals](#)". Drugs.com. Retrieved March 24, 2022.
8. Durand, A., et al. "Comparative pharmacokinetic profile of two imidazopyridine drugs: zolpidem and alpidem." *Drug Metabolism Reviews* 24.2 (1992): 239-266. <https://doi.org/10.3109/03602539208996294>
9. Fraisse, J., D. Garrigou-Gadenne, and J. P. Thénot. "Pharmacokinetic and metabolic profiles of zolpidem." In: Freeman H, Puech AJ, Roth T, eds. *Zolpidem: an update of its pharmacological properties and therapeutic place in the management of insomnia*. Paris: Elsevier (1996): 45-57.
10. Lewis, John H., and John H. Vine. "A simple and rapid method for the identification of zolpidem carboxylic acid in urine." *Journal of Analytical Toxicology* 31.4 (2007): 195-199. <https://doi.org/10.1093/jat/31.4.195>
11. Greenblatt, David J., et al. "Influence of food on pharmacokinetics of zolpidem from fast dissolving sublingual zolpidem tartrate tablets." *The Journal of Clinical Pharmacology* 53.11 (2013): 1194-1198. <https://doi.org/10.1002/jcph.159>
12. Guo, Tao, et al. "Comparative pharmacokinetics of zolpidem tartrate in five ethnic populations of China." *Acta Pharmaceutica Sinica B* 4.2 (2014): 146-150. <https://doi.org/10.1016/j.apsb.2014.02.001>
13. "[Questions and Answers: Risk of next-morning impairment after use of insomnia drugs; FDA requires lower recommended doses for certain drugs containing zolpidem \(Ambien, Ambien CR, Edluar, and Zolpimist\)](#)". Food and Drug Administration. February 13, 2018. Retrieved March 24, 2022.
14. "[Questions and Answers: Risk of next-morning impairment after use of insomnia drugs; FDA requires lower recommended doses for certain drugs containing zolpidem \(Ambien, Ambien CR, Edluar, and Zolpimist\)](#)". Food and Drug Administration. February 13, 2018. Retrieved March 24, 2022.
15. Greenblatt, David J., et al. "Gender differences in pharmacokinetics and pharmacodynamics of zolpidem following sublingual administration." *The Journal of Clinical Pharmacology* 54.3 (2014): 282-290. <https://doi.org/10.1002/jcph.220>
16. "[ANSI/ASB Standard 121: Standard for Analytical Scope and Sensitivity of Forensic Toxicological Testing in Drug-Facilitated Crime Investigations](#)". First Edition, 2021. Academy Standards Board, American Academy of Forensic Sciences. 2022. Retrieved March 25, 2022.
17. Villain, M., et al. "Windows of detection of zolpidem in urine and hair: application to two drug facilitated sexual assaults." *Forensic Science International* 143.2-3 (2004): 157-161. <https://doi.org/10.1016/j.forsciint.2004.04.019>

SOFT-DFC SNAPSHOT – ZOLPIDEM

By Marc A. LeBeau, Ph.D., F-ABFT for the SOFT DFC Committee

18. Shi, Yan, et al. "A rapid and accurate UPLC/MS/MS method for the simultaneous determination of zolpidem and its main metabolites in biological fluids and its application in a forensic context." *Journal of Chromatography B* 911 (2012): 140-146. <https://doi.org/10.1016/j.jchromb.2012.10.018>
19. Weinling, Estelle, et al. "Pharmacokinetic profile of a new modified release formulation of zolpidem designed to improve sleep maintenance." *Fundamental & Clinical Pharmacology* 20.4 (2006): 397-403. <https://doi.org/10.1111/j.1472-8206.2006.00415.x>
20. Shima, Noriaki, et al. "Single-hair analysis of zolpidem on the supposition of its single administration in drug-facilitated crimes." *Forensic Toxicology* 33.1 (2015): 122-130. <https://doi.org/10.1007/s11419-014-0260-7>
21. Cui, Xiaopei, et al. "Segmental hair analysis after a single dose of zolpidem: comparison with a previous study." *Journal of Analytical Toxicology* 37.6 (2013): 369-375. <https://doi.org/10.1093/jat/bkt035>
22. "[Factual basis](#)". justice.gov. The U.S. District Court, Eastern District of Louisiana. May 29, 2015. Retrieved March 25, 2022.
23. Gorman, Steve; Trott, Bill; Cooney, Peter (March 23, 2015). "[Ex-NFL star Sharper admits to sexual assaults in California, Arizona](#)". Reuters. Retrieved March 25, 2022.
24. "[Darren Sharper Sentenced on Drug Distribution Charges](#)". US Attorney's Office, Eastern District of Louisiana. US Department of Justice. August 18, 2016. Retrieved March 25, 2022.
25. "[Former St. Bernard Parish Deputy Pleads Guilty in Darren Sharper Matter](#)". US Attorney's Office, Eastern District of Louisiana. US Department of Justice. July 15, 2016. Retrieved March 25, 2022.
26. "[Local Businessman Handed Maximum Sentence for Transporting a Female Employee for Criminal Sexual Conduct](#)". US Attorney's Office, Southern District of Texas. US Department of Justice. April 8, 2015. Retrieved March 25, 2022.
27. Carfora, Anna, et al. "Long-term detection in hair of zolpidem, oxazepam and flunitrazepam in a case of drug-facilitated sexual assault." *Journal of Analytical Toxicology* 46.1 (2022): e16-e20. <https://doi.org/10.1093/jat/bkaa174>

IN MEMORIAM

KENT GARRIS JOHNSON, M.S.



Kent was born to Bud and Betty Johnson (predeceased in death) of Dublin, Indiana on July 16, 1954. He was the youngest of three boys, his older brothers being Dennis and Neal Johnson. In 1976 he graduated from Georgetown College, Kentucky, with a degree in Biology and a minor in Chemistry. Later he completed his Masters in Forensic Toxicology at the University of Florida. After beginning his career in forensic toxicology in Lexington, Kentucky in 1976, he subsequently

obtained a job in Ft. Worth, Texas where he met his future wife Susan (McKinnis) Johnson. Kent and Susan married in August 1979, and had four children during their time in Ft. Worth. Following a period of three years in Houston, the family moved to Portland, Oregon in 1994 for Kent's work at MetroLab/Legacy Laboratory Services, where he served as Scientific and Lab Director until 2008. Since 2008 Kent held several positions in the forensic toxicology field, starting several labs and most recently operating as a consultant and lab director for several labs around the country. He also served for numerous years as a certified lab inspector. The Portland area remained his home base, and he and Susan enjoyed their many travels together and with their family around the Northwest, the country, and the world. Some of his interests as a young man and throughout life included golf, flying airplanes,

and the Dallas Cowboys. A gifted musician, Kent also served as interim music minister for several years at First Baptist Church of Beaverton, Oregon. Kent's greatest joy was his family.

Fond memories and expressions of sympathy may be shared at www.finleysunsethills.com for the Johnson family.

DEPARTMENT OF HEALTH AND HUMAN SERVICES FUNDING OPPORTUNITY

The goal of this funding opportunity announcement (FOA) is to seek research to promote rapid development of analytical methods and tools to assess the prevalence of emerging illicit drugs and thereby understand their health impacts.

By promoting research to develop peer-re-

viewed analytical and point of care assays for new drugs and metabolites, NIH intends that awardees can greatly reduce the cost of validated assay implementation and ensure the methods become standards at “sentinel” labs and clinical sites that employ them. Importantly, the initiative design builds in the flexibility to modify the target analytes over time to

allow a rapid response to changing opioid threat conditions.

[RFA-DA-23-045 “Rapidly Assessing the Public Health Impact of Emerging Opioid Threats”](#)

Key Dates

Posted Date	July 07, 2022
Open Date (Earliest Submission Date)	January 02, 2023
Letter of Intent Due Date(s)	January 2, 2023

Application Due Dates			Review and Award Cycles		
New	Renewal / Resubmission / Revision (as allowed)	AIDS	Scientific Merit Review	Advisory Council Review	Earliest Start Date
February 02, 2023	Not Applicable	Not Applicable	July 2023	August 2023	December 2023

All applications are due by 5:00 PM local time of applicant organization. Applicants are encouraged to apply early to allow adequate time to make any corrections to errors found in the application during the submission process by the due date.

Expiration Date	February 03, 2023
Due Dates for E.O. 12372	Not Applicable

SOFT offers several Continuing Education opportunities to members and non-members. All SOFT webinars are available on demand. The cost to participate in a SOFT webinar is \$25 for SOFT members and \$35 for non-members. The cost to participate in a joint webinar is free to SOFT/TIAFT members and \$50 for non-members. SOFT membership is required to participate in the JAT offering and is free. You may claim credit for your participation in SOFT Continuing Education opportunities. Accreditation is provided by American Association for Clinical Chemistry (AACC). Please click the webinar title to the right to view more information and to register.



INTERPRETATION OF FORENSIC TOXICOLOGY RESULTS AROUND THE GLOBE AND INTO THE FUTURE

ANALYTICAL, INTERPRETIVE, AND LEGAL ISSUES SURROUNDING THC ANALOGS IN DUID CASEWORK

OK, YOU'RE AN EXPERT - NOW WHAT? AN INTRODUCTION TO EXPERT WITNESS TESTIMONY

NPS IN COMBINATION WITH EVERYTHING!

NOVEL PSYCHOACTIVE SUBSTANCES: ANALYTICAL METHODS AND ENCOUNTERED CHALLENGES (PART 1)

STATE OF DRUG-FACILITATED CRIMES TESTING - 2022



**DON'T
MISS AN
ISSUE
OF JAT!**

PLEASE SEND YOUR ADDRESS UPDATES TO THE
SOFT OFFICE SO WE CAN UPDATE YOUR ACCOUNT
WITH JAT. PLEASE EMAIL CC@SOFT-TOX.ORG

**FOLLOW
SOFT ON
SOCIAL
MEDIA!**



@SOCIETYOFFORENSICTOXICOLOGISTS



@SOFTTOX

2022 COMMITTEE CHAIRS

APPLIED ANALYTICAL TOXICOLOGY COMMITTEE: REBECCA WAGNER AND WAYNE LEWALLEN

AWARDS COMMITTEE: TIM ROHRIG

CFSO LIAISON: TIM ROHRIG

COMMUNICATIONS COMMITTEE: MATT JUHASCIK

CONTINUING EDUCATION COMMITTEE: ROBERT JOHNSON

CULTURE, VALUES AND DIVERSITY COMMITTEE: SAMANTHA TOLLIVER AND GAIL COOPER

DRUG FACILITATED CRIMES COMMITTEE: LISA REIDY

DRUGS & DRIVING COMMITTEE: DAYONG LEE AND NICK TISCIONE

ETHICS COMMITTEE: MADELINE MONTGOMERY

FINANCE COMMITTEE: TATE YEATMAN

MEETING RESOURCE COMMITTEE: MARC LEBEAU

MEMBERSHIP COMMITTEE: CHRIS HEARTSILL

MENTORING COMMITTEE: KIM SAMANO AND COURTNEY WARDWELL

NOMINATING COMMITTEE: AMY MILES

NPS COMMITTEE: DANI MATA AND KAYLA ELLEFSEN

ORAL FLUID COMMITTEE: CURT HARPER AND MADELEINE SWORTWOOD

POLICIES & PROCEDURES COMMITTEE: CHRIS HEARTSILL

POSTMORTEM TOXICOLOGY COMMITTEE: JOE KAHL AND SAMANTHA TOLLIVER

PUBLICATIONS COMMITTEE: STEPHEN RASO

SOFTOPICS: DANI MATA, VANESSA MENESES, AND ALANNA DEKOROMPAY

TOXICOLOGY RESOURCE COMMITTEE: AMY MILES

YOUNG FORENSIC TOXICOLOGISTS COMMITTEE: AMANDA RAUSCH

FUTURE SOFT MEETINGS

2023
GAYLORD ROCKIES, DENVER, CO
OCTOBER 29–NOVEMBER 3, 2023
DAN ANDERSON AND VANESSA BEALL

2024
UNION STATION, ST. LOUIS, MO
OCT 27-NOV 2
SARAH RILEY AND JUSTIN POKLIS

2025
PORTLAND, OR

2026 (SOFT/TIAFT)
CHICAGO, IL
LUKE RODDA AND ANDRE SUKTA

TOXTALK

TOXTALK® is the official publication of the Society of Forensic Toxicologists and is published quarterly. To submit articles and advertising opportunities please email CC Watson at cc@soft-tox.org

DEADLINES FOR CONTRIBUTIONS:

ISSUE 4:
SUBMISSION DUE BY **NOV 14**
PUBLISHING **DEC 9**

CONTACT SOFT

SOFT OFFICE
1955 W. BASELINE RD.
STE 113-442 MESA, AZ 85202

GENERAL INFORMATION:
PH: 480-839-9106
E: info@soft-tox.org

EXHIBITOR/SPONSORSHIP:
exhibitor@soft-tox.org

MEMBERSHIP:
cc@soft-tox.org

SOFT WEBSITE:
soft-tox.org

SOCIAL MEDIA:

