SWAFS

2020 Virtual Conference

October 5th, 6th, and 8th

Join the Southwestern Association of Forensic Scientists for the 2020 Virtual Conference!

SWAFS is excited to announce our first ever virtual conference to be held on October 5th, 6th, and 8th. Thanks to our sponsors, registration and attendance are free to both SWAFS members and non-members in the various forensic science disciplines. This conference will be similar to our in-person events and certificates will be given for individual disciplines. Certificates will be offered on each day to align with our goal of providing continuing education opportunities for forensic scientists. Topics will include seized drugs, toxicology, DNA, and much more. Attendees will be able to learn about new technologies and methodologies presented by our sponsored vendors.

Hosted by NIJ's Forensic Technology Center of Excellence, RTI International, and SWAFS

Sponsored by the National Institute of Justice

Hello 2020 SWAFS Virtual Conference Attendees!

As SWAFS continues to be a leader among forensic organizations, we strive to provide our members with relevant and necessary information. Our objective is to equip them with the tools to promote growth and success within their respective disciplines and throughout the forensic science community. SWAFS conferences seek to present topics that matter to your unique challenges and help you stay abreast with the current trends, techniques, and technologies. Another important aspect of our conference is networking. While networking is difficult in a virtual setting, we hope to have discussions to help us all feel like we are part of a greater forensic community.

Why You Should Attend

- Free registration and no travel costs. Learn without leaving the laboratory!
- On-demand access for content review
- Certificates will be provided for continuing education credits
- Open discussion at the end of each presentation for questions
- New technology and methodology presentations by our sponsored vendors with a chance to win exciting door prizes!

SWAFS is excited to coordinate and present this amazing virtual conference to the forensic community. We cannot wait to see you there!

Do you want to become a SWAFS Member? Click HERE to find out how!

The Forensic Technology Center of Excellence is led by RTI International, a global research institute dedicated to improving the human condition by turning knowledge into practice. With a staff of more than 5,000 people, RTI brings a global perspective by providing research and technical services to governments and businesses in more than 75 countries. Together, RTI, the FTCoE, and their partners encompass all the forensic disciplines, providing unparalleled experience, knowledge, resources, and expertise vital to the advancement of forensic science. Our academic partners are accredited institutions that have a proven history of providing state-of-the-art education and research to the forensic science community. Our industry partners utilize a combination of science and advanced, novel technology to resolve criminal casework, further catalyzing the adoption of new methodologies and technologies into the field of forensic science.

The Southwestern Association of Forensic Scientists was founded in February of 1977. James Alan Zotter, Floyd McDonald, Max Courtney, and Bill McClain founded the organization, with assistance from Wild Turkey, during the American Academy of Forensic Science meeting in St. Louis, Missouri. This Association is formed for the following reasons:

(a) To provide an association for persons who are actively engaged in the profession of scientific examination of physical evidence in an organized body so that the profession of all its disciplines may be effectively and scientifically practiced.

(b) To exchange information among forensic scientists to improve techniques.

(c) To encourage research in forensic science.

(d) To keep its members apprised of the latest techniques and discoveries in forensic science.

(e) The Association shall be limited to such activities as fall within the scientific and educational purposes as prescribed by Section 501 (c) (3) of the Internal Revenue Code.

Monday - October 5th, 2020

9:00 am ET – 9:30 am ET

Opening Remarks

Dr. Jonathan McGrath, Ph.D., Department of Justice's National Institute of Justice, Office of Investigative and Forensic Sciences in Washington, DC., Senior Policy Analyst

9:30 am ET – 1:30 pm ET

Drugs: Δ9-THC Semi-Quant Validation and Method Procedure

Terra Lucas, Arkansas State Crime Lab, Forensic Chemist II

1:30 pm ET – 2:00 pm ET

Lunch Break

2:00 pm ET – 3:00 pm ET

Toxicology: PCP Trends and Challenges in Houston

Dr. Peter Stout, Houston Forensic Science Center, CEO and President

3:00 pm ET – 4:00 pm ET

Toxicology: Case Studies

Kristen Mauldin, Head of Toxicology section at the Arkansas State Crime Laboratory

4:00 pm ET – 5:00 pm ET

CODIS: House Bill 1399 - Challenges and Successes at Texas DPS

Ryan Strand, CODIS LIMS Specialist, Crime Laboratory Service, Texas Department of Public Safety

5:00 pm ET – 6:00 pm ET

CODIS: Backlogs and Process Improvement

Jennifer Clay, Houston Forensic Science Center, CODIS administrator

Tuesday – October 6ᵗʰ, 2020

9:00 am ET – 10:00 am ET	*Drugs: The Impact of Heavy Metals on Cannabis Toxicity* Robert Thomas, Scientific Solutions Educational Consulting Company, Principal
10:00 am ET – 11:00 am ET	*Drugs: Collaborative Research for Fundamental Insight into Cannabis Production* Dr. Mark Roggen, CEO, Complex Biotech Discovery Ventures
11:00 am ET – 1:00 pm ET	*Quality Control: Blind Quality Control Cases* Erika Ziemak, Houston Forensic Science Center, Quality Division Director
1:00 pm ET – 1:30 pm ET	*Vendor: Agilent – Direct Real Time GCMS Analysis Using Agilent's QuickProbe Technology* Kirk Lokits, Agilent Technologies, GCMS Applications Scientist
1:30 pm ET – 2:00 pm ET	*Vendor: Waters – THC Quantification; the UPLC Story* Tamara Keller, Waters Technologies, Chemistry Specialist
2:00 pm ET – 4:00 pm ET	*Toxicology: An Overview of OSAC/ASB Documents for Toxicology* Dr. Marc LeBeau, FBI Laboratory, Senior Forensic Scientist of the Scientific Analysis Section
4:00 pm ET – 5:00 pm ET	*Arson: Fire Debris – A Brief Introduction* Lindsey Bynum, Texas Department of Public Safety, Fire Debris Section
5:00 pm ET – 6:00 pm ET	*Documents: Forensic Document Examination* Sarah Pryor, Texas Department of Public Safety Crime Laboratory, Forensic Document Examiner

Thursday – October 8th, 2020

9:00 pm ET – 11:00 am ET

Drugs: An Overview of Methamphetamine and Fentanyl Clandestine Laboratories

Dr. Jarrad Wagner, Oklahoma State University Center for Health Sciences, Professor of Forensic Sciences

Dr. Austin Ciesielski, Oklahoma State University Center for Health Sciences (OSU-CHS) Forensic Toxicology and Trace Laboratory, Postdoctoral Researcher

11:00 am ET – 1:00 pm ET

Transforming Crime Scene Investigation, Evidence Handling and Management

Dr. Peter Stout, Houston Forensic Science Center, CEO and President

Jerry Pena, Houston Forensic Science Center, Director of the Crime Scene Unit/Multimedia Evidence Section

1:00 pm ET – 1:30 pm ET

Vendor: SCIEX - Reduce Analytical Interferences with Ultra-Sensitive LC-MS/MS and MRM3

Dr. Kevin He, SCIEX, Senior Manager for Applications in Clinical Research and Forensics

1:30 pm ET – 2:00 pm ET

Vendor: Shimadzu - How HPLC and LCMS Fit within your Drug Lab

Sarah Olive, Shimadzu Scientific Instruments, Mass Spectrometry Technical Support Scientist

2:00 pm ET – 3:00 pm ET

Quality: Maintaining Objectivity & Avoiding Cynicism

Kevin Sontag, Arkansas State Crime Lab, Forensic Serologist

3:00 pm ET – 4:00 pm ET

Quality: Designing a Comprehensive Quality Metric to Drive Excellence

Aimee Grimaldi, Houston Forensic Science Center, Project Engineer

Paula Evans, Houston Forensic Science Center, Project Engineer

|Monday – October 5th, 2020|

9:00 am ET – 9:30 am ET

Opening Remarks: NIJ Updates and FTCoE Resources Overview

Dr. Jonathan McGrath, Ph.D., Department of Justice's National Institute of Justice, Office of Investigative and Forensic Sciences in Washington, DC., Senior Policy Analyst

Abstract: Dr. Jonathan McGrath will be giving detailed updates within the National Institute of Justice and an overview of the Forensic Technology Center of Excellence program and resources.

9:30 am ET – 1:30 pm ET

Drugs: Δ9-THC Semi-Quant Validation and Method Procedure

Terra Lucas, SWAFS, Chair of the Meeting Advisory Committee

Abstract: State and local crime laboratories are facing many new challenges as medical marijuana and hemp become legalized across the United States. Since hemp is defined by its Δ9-tetrahydrocannabinol concentration, it has become a significantly more difficult task to differentiate between it and marijuana. Traditional quantitative methods are demanding, costly, and time consuming. Therefore, an easier, faster, and more cost effective semi-quantitative procedure was developed to help distinguish between plant material containing a high Δ9-THC concentration and plant material containing a low Δ9-THC concentration. This presentation will discuss the method development and validation process that was conducted for the Δ9-THC Semi-Quant analytical technique, along with how to properly perform the analysis, interpret the data, and form a conclusion.

2:00 pm ET – 3:00 pm ET

Toxicology: PCP Trends and Challenges in Houston

Dr. Peter Stout, Houston Forensic Science Center, CEO and President

Abstract: Phencyclidine (PCP) was first synthesized in 1926 and originally developed in the 1950s as a general anesthetic agent. PCP abuse declined nationally in the 1960s, but remains prevalent in certain pockets of the country, including Houston. The research to be presented in this lecture evaluates PCP-positive cases of driving while intoxicated (DWI) from 2013 to 2018. The blood samples were collected from drivers and submitted by the Houston Police Department for alcohol and drug analysis. The research evaluated toxicological findings and demographic information for the impaired driving cases that tested positive for PCP in blood. Additionally, Drug Recognition Expert (DRE) findings were examined for 12 cases in 2018. In this presentation, Dr. Peter Stout, CEO and president of the Houston Forensic Science Center and one of the report's authors, will share the research findings along with the valuable regional information it highlights to allow participants to better understand the demographic

patterns of PCP-impaired drivers in Houston over the last six years. The findings may aid in designing and implementing regulations and prevention programs to reduce PCP-impaired driving.

3:00 pm ET – 4:00 pm ET

Toxicology: Case Studies

Kristen Mauldin, Head of Toxicology section at the Arkansas State Crime Laboratory

Abstract: This presentation examines various forensic toxicology cases tested at the Arkansas State Crime Laboratory. These examples illustrate the impact toxicology testing has on medicolegal death determinations. As drug trends continually change, we must change with them to provide clear and concise reports to our pathologists.

4:00 pm ET – 5:00 pm ET

CODIS: House Bill 1399 - Challenges and Successes at Texas DPS

Ryan Strand, CODIS LIMS Specialist, Crime Laboratory Service, Texas Department of Public Safety

Abstract: Effective September 1st, 2019, House Bill 1399 is a major update to legislation regarding mandatory DNA collection of offender profiles in the state of Texas. The bill requires DNA collection at arrest from individuals charged with any of 24 felony offenses. As a result, the Texas SDIS lab responsible for processing all these new samples had to quickly prepare, adapt, and overcome multiple challenges to successfully implement the law across the state. Challenges included assisting booking stations across 254 counties of Texas with developing new processes for DNA collection, maintaining internal efficiency while receiving approximately 2,500 additional samples per month, and analyzing data to track hits, other successes, and areas for improvement. In less than a year since implementation of House Bill 1399, the Texas SDIS lab has assisted with over 100 hits nationally from these samples, including multiple cold cases and violent offenses.

5:00 pm ET – 6:00 pm ET

CODIS: Backlogs and Process Improvement

Jennifer Clay, Houston Forensic Science Center, CODIS administrator

Abstract: What's the one thing all crime laboratories have in common? BACKLOGS! From latent prints to seized drugs, forensic biology, and firearms, all forensic disciplines either have a backlog or have experienced the pressure of eliminating one. Backlogs are an unwanted but inevitable part of all crime laboratories, often in addition to the pressure of keeping up with the ever-changing demands, technologies, needs and unexpected events. Increasing workloads and advancements in technology have left crime labs struggling as they race to meet needs with shrinking resources and often stagnant budgets. And so, we look for efficiencies. This workshop will share the experiences of Houston Forensic Science Center's CODIS unit, which was forced to take on a vast process improvement project due to a bottleneck in the process. The lean six sigma project goals were to provide better quality results and accountability within the organization and to stakeholders. But the real benefit of these improvements didn't truly come to light until March 2020 when the global pandemic forced immediate and widespread

changes to workflows and processes lab wide. The CODIS Unit's work increased by more than ten times shortly after the pandemic hit. But the process improvements implemented a few years ago allowed the group to successfully navigate and adjust to this new "normal."

|Tuesday – October 6th, 2020|

9:00 am ET – 10:00 am ET

Drugs: The Impact of Heavy Metals on Cannabis Toxicity

Robert Thomas, Scientific Solutions Educational Consulting Company, Principal

Abstract: The lack of federal oversight with regard to medicinal cannabis and hemp products in the US has meant that it has been left to the individual states to regulate its use. Medical marijuana is legal in 33 states, while 11 states allow its use for adult recreational consumption. The sale of these products is strictly regulated by their THC and CBD content, depending on their use. However, it is also critical to monitor levels of contaminants such as heavy metals, as the cannabis plant is known to be a hyper-accumulator of heavy metals in the soil. Unfortunately, there are many inconsistencies with heavy metal limits in the different states where medical cannabis is legal. Some states define four heavy metals while others specify up to eight. Some are based on limits directly in the cannabis, while others are based on consumption per day. Others take into consideration the body weight of the consumer, while some states do not even have heavy metal limits. Clearly, there is a need for consistency across state lines, in order for consumers to know they are using safe products. This presentation will take a closer look at how the pharmaceutical industry changed its 100-year old sulfide precipitation test for a small group of heavy metals to finally arrive at a list of 24 elemental impurities using plasma spectrochemical techniques. The cannabis industry can learn a great deal from this process to not only understand the many potential sources of heavy metal contamination, but also how the final cannabis products can be contaminated by the manufacturing equipment, the extraction process, and the delivery systems used.

10:00 am ET – 11:00 am ET

Drugs: Collaborative Research for Fundamental Insight into Cannabis Production

Dr. Mark Roggen, CEO, Complex Biotech Discovery Ventures

Abstract: The cannabis industry has recently experienced extreme growth and progress in all fields. States and countries are legalizing cannabis, cannabis producers are seeing unprecedented business growth, and new treatment options for various conditions are being researched and approved. One fear that accompanies all this progress is that fundamental research lags behind.

With our research laboratory, Complex Biotech Discovery Ventures (CBDV), we seek to add fundamental scientific insight to the field of cannabis production. This presentation will highlight our latest findings in understanding, controlling, and optimizing cannabis production in analytics, processing, extraction, and formulation.

In an effort to quickly understand the fundamental factors that govern extracting and processing cannabis plants, we have undertaken statistical analyses of supercritical CO_2 and ethanol extraction, performed computational studies on THCA and CBDA decarboxylation, and developed reaction progress probes. We will present our latest findings on how to understand and control these processes. Additionally, we have developed a host of in-process analytical tools and protocols that we see as vital to the growth of the industry.

11:00 am ET – 1:00 pm ET

Quality Control: Blind Quality Control Cases

Erika Ziemak, Houston Forensic Science Center, Quality Division Director

Abstract: The Houston Forensic Science Center has spent five years building a robust blind quality control (BQC) program designed to test laboratory workflows, processes, analyses, and quality management systems from start to finish. Each month, the quality division submits more than 40 blind quality control cases that mimic real casework into the laboratory's workflow. This presentation will focus on the importance of the blind quality control program, the history of the program's initial implementation in the toxicology section in 2015, and the program's expansion since then into all other disciplines outside the crime scene unit. We will discuss details for the preparation of blind quality control samples in various disciplines, challenges we have encountered, data regarding analysis and review of blind quality control samples, and an overview of costs of the program. Lastly, we will discuss the blind quality control system's role in HFSC's quality management system and in staff testimony.

1:00 pm ET – 1:30 pm ET

Vendor: Agilent – Direct Real Time GCMS Analysis Using Agilent's QuickProbe Technology

Kirk Lokits, Agilent Technologies, GCMS Applications Scientist

Abstract: The utilization of electron ionization GCMS and the subsequent chromatographic and spectral data have become routine in forensic analysis of unknown powders, tablets, and liquids. However, this analysis usually requires some sample preparation and or acid/base extractions. Furthermore, runtimes can easily range from 10 to 30 minutes or more for general GCMS sample screening methods. In this presentation, a new fast GCMS screening technique is demonstrated in under 1.5 minutes and requires minimal to no sample preparation prior to analysis. This technique produces "classical EI" spectra for the identification of compounds in a variety of matrices and is achieved by using the Agilent QuickProbe™ GC/MS. This work seeks to illustrate how this technique can be used as a fast-qualitative screening tool on existing 5977B/7890B or the new 8890 GC. Overall control of the QuickProbe™ and the GCMS system utilizes Agilent's MassHunter software for streamlined access to acquisition parameters, qualitative analysis, Unknowns Analysis, and reporting.

1:30 pm ET – 2:00 pm ET

Vendor: Waters – THC Quantification; the UPLC Story

Tamara Keller, Waters Technologies, Chemistry Specialist

Abstract: Before even beginning to tackle the analytical issues associated with quantitating THC and plant material in general, you must decide what your overall goal should be. Do you want the decarboxylated THC concentration or a "true" THC and THCA concentration measured? Do you want to be able to distinguish between delta-8 and delta-9 THC? Is your overall goal just to determine if the material is categorized as hemp or marijuana?

All these questions are completely valid. There is no "right" way to tackle this analytical issue. Waters Technology would like to propose a solution to some of these challenges in a quick, effective method based on the Ultra Performance Liquid Chromatography (UPLC) technology. This solution determines the "true" concentration of THC and THCA (CBD and CBDA) and distinguishes between all the THC isomers. Utilizing liquid chromatography, you can meet all your goals and many more you never knew you could achieve! We hope you can join us!

2:00 pm ET – 4:00 pm ET

Toxicology: An Overview of OSAC/ASB Documents for Toxicology

Dr. Marc LeBeau, FBI Laboratory, Senior Forensic Scientist of the Scientific Analysis Section

Abstract: One of the driving forces behind forensic science improvements has been the creation of the Organization of Scientific Area Committees (OSAC) and the use of standards development organizations (SDOs) to develop consensus-based national standards of practice. While these organizations follow two distinct processes, combined they offer the ability to develop consensus-based practices that, when finalized, should carry the support of their respective communities.

The OSAC is composed of subcommittees for the major forensic science disciplines. Forensic Toxicology is one such subcommittee and its members represent practitioners from state, local, federal, and commercial laboratories. Additionally, members include experts from academic institutions, federally-funded research and development centers, and in the statistics, human performance, quality assurance, and legal fields. These individuals, as well as affiliate members that serve as subject matter experts for specific topics, are responsible for drafting documents that align with the Forensic Toxicology Subcommittee's roadmap of documents. Once the draft documents have been finalized and approved to move out of the OSAC, they are passed to an SDO.

While there a number of choices in SDOs, the field of forensic toxicology has embraced the Academy Standards Board (ASB) of the American Academy of Forensic Sciences. The ASB, accredited by the American National Standards Institute (ANSI), ensures that all potential customers of the standard have the opportunity to comment on documents during an open review period. Those comments are then adjudicated by a consensus body. ASB Consensus Bodies are composed of academia, consumer groups, laboratories and/or testing facilities, producers, subject matter experts, users from both the government and industry, as well as a general interest category that includes legal staff (judges and lawyers), retirees, and students. This approach helps ensure that all impacted customers have a voice in the development of these consensus standards.

An ASB/ANSI published standard can then be considered for inclusion on the OSAC Registry. Documents included on this registry are viewed as the most-relevant, well-vetted documents for the areas of forensic science that they are meant to represent.

Over the past two years, the ASB has released several forensic toxicology documents for public review; many of which have now been finalized as ANSI National Standards and included on the OSAC Registry. This talk will review the OSAC and ASB processes and discuss the major points of many of these documents.

4:00 pm ET – 5:00 pm ET

Arson: Fire Debris – A Brief Introduction

Lindsey Bynum, Texas Department of Public Safety, Fire Debris Section

Abstract: From evidence preparation to data analysis, this presentation will serve as a brief introduction to the world of fire debris analysis. After going through the basics (along with some tips and tricks), some practical examples will be given to put what we learned to use.

5:00 pm ET – 6:00 pm ET

Documents: Forensic Document Examination

Sarah Pryor, Texas Department of Public Safety Crime Laboratory, Forensic Document Examiner

Abstract: Forensic document examination analyzes evidence to determine the origin and authenticity or authorship of documents in a variety of crimes, including but not limited to forgery, fraud, homicide/suicide, threatening correspondence, tampering with government documents, and counterfeiting. This presentation will introduce the discipline of forensic document examination and will explore the types of analyses that can be conducted on document evidence.

While this presentation will focus on specific examinations that are conducted in the State of Texas for the Texas Department of Public Safety, it will explore typical analyses that any legitimate forensic document discipline will perform. Forensic document examinations that will be described include the following: handwriting identification, paper batch match and reconstruction, envelope batch matching, examination/preservation of charred and saturated documents, latent writing impression restoration, image enhancement, identification of conventional and digital print processes, document authentication, spectral ink comparison, examination of carbon ribbon evidence (typewriters), and other miscellaneous document examinations. The presentation should also assist in familiarization of conclusions that may be reported and understanding those conclusions.

|Thursday – October 8ᵗʰ, 2020|

9:00 am ET – 11:00 am ET

Drugs: An Overview of Methamphetamine and Fentanyl Clandestine Laboratories

Dr. Jarrad Wagner, Oklahoma State University Center for Health Sciences, Professor of Forensic Sciences

Dr. Austin Ciesielski, Oklahoma State University Center for Health Sciences (OSU-CHS) Forensic Toxicology and Trace Laboratory, Postdoctoral Researcher

Abstract: Clandestine laboratories (clan labs) that produce illicit drugs are encountered world-wide, which coincides with the large influx of illicit methamphetamine and fentanyl in the United States. Methamphetamine production takes place through several common routes. This presentation will describe an overview of precursors, reagents, equipment, and products of the Iodine/Phosphorus and Alkali Metal/Ammonia synthetic routes. Following this, an overview of precursors, reagents, equipment, and products associated with fentanyl laboratories using the Siegfried and Janssen methods of production will be provided. Safety issues, detection techniques, and analytical methods associated with each lab type will be described.

11:00 am ET – 1:00 pm ET

Transforming Crime Scene Investigation, Evidence Handling, and Management

Dr. Peter Stout, Houston Forensic Science Center, CEO and President

Jerry Pena, Houston Forensic Science Center, Director of the Crime Scene Unit/Multimedia Evidence Section

Abstract: The Houston Forensic Science Center has transformed a crime scene unit with lax procedures, weak evidence collection and handling processes, and little oversight into an independently run accredited civilian team that follows strict standard operating procedures. Jerry Pena came to HFSC with decades of experience overseeing crime scene units, including transitioning the groups from classified to civilian personnel. Mr. Pena will share HFSC's story, the challenges of transforming and transitioning a crime scene unit, and the clear advantages at the end of the often-arduous process. But crime scene investigation is only the first part of the story if crime laboratories want to decrease evidence contamination, improve evidence integrity, and gain overall efficiencies. An entire overhaul of evidence and property management is needed to truly achieve these goals and improve the criminal justice system. Dr. Stout will present a proposal to consolidate property management in Houston and Harris County in a way that reimagines how evidence handling has been viewed for decades. Instead of law enforcement agencies overseeing this crucial function, we propose a joint city/county partnership with independent civilian oversight, creating an independent structure that includes logistics and quality experts. Evidence is often the key to a successful trial. Dr. Stout's proposal lays out a blueprint to overhaul an antiquated system.

1:00 pm ET – 1:30 pm ET

Vendor: SCIEX - Reduce Analytical Interferences with Ultra-Sensitive LC-MS/MS and MRM3

Dr. Kevin He, SCIEX, Senior Manager for Applications in Clinical Research and Forensics

Abstract: In this presentation, we will introduce several key changes that were made to the design of SCIEX Triple Quad™ 7500 LC-MS/MS System – QTRAP® Ready that allowed for the trace level detection of forensic analytes. Using the unique MRM3 scan function with the QTRAP® System, we observed significant sensitivity gain that greatly enhance detection of challenging analytes in complex matrixes.

1:30 pm ET – 2:00 pm ET

Vendor: Shimadzu - How HPLC and LCMS Fit within your Drug Lab

Sarah Olive, Shimadzu Scientific Instruments, Mass Spectrometry Technical Support Scientist

Abstract: Liquid chromatography is an efficient separation technique for non-volatile and thermally labile compounds. The functional groups of some drugs hinder their ability to be measured by GCMS within the drug lab but in turn make them ionizable for LCMS without derivatization. This presentation will share the fundamentals of liquid chromatography, the types of mass spectrometry detectors, and examples of LCMS amenable drugs that come through the lab such as cannabinoids, fentanyl analogs, and amphetamines.

2:00 pm ET – 3:00 pm ET

Quality: Maintaining Objectivity & Avoiding Cynicism

Kevin Sontag, Arkansas State Crime Lab, Forensic Serologist

Abstract: As we progress and mature as forensic scientists, our cases will become more complex and demanding. Like the waves on the sea, they will keep coming and coming. It is very important to develop skills that will help us manage the underlying, creeping stress that can affect all of us due to the vicarious trauma we may experience as we work our cases. These cases we work are larger than ourselves and affect many people at different levels. It is critical to remember this fact when our objectivity is under attack or when cynicism is whispering in our ear. This presentation is geared towards the new analyst and the seasoned analyst alike. We will not only discuss the "Why," but also touch on the "How" with several action items that will help us to develop better workforce resiliency for when we are in the crucible. So, come hear why it is important to remain objective and guard against cynicism as we serve the criminal justice system.

Quality: Designing a Comprehensive Quality Metric to Drive Excellence

Aimee Grimaldi, Houston Forensic Science Center, Project Engineer

Paula Evans, Houston Forensic Science Center, Project Engineer

Abstract: The Houston Forensic Science Center (HFSC) created a lean six sigma development group in 2018 to facilitate process improvement projects organization-wide. The projects are designed to yield cost savings, faster turnaround times, and improved quality.

 This year in particular was the year of quality.

The LSS group led two company-wide projects that focused on quality. This presentation will review the technical/administrative and quality score projects, their goals and objectives and the outcome.

This one-hour session will provide the audience with a model they can take back to their laboratories that will help them identify factors that impact quality. Attendees will learn the value of using lean and six sigma tools to identify ways to streamline processes and create a preventive quality culture.

Dr. Jonathan McGrath, Ph.D.

Department of Justice's National Institute of Justice, Office of Investigative and Forensic Sciences in Washington, DC., Senior Policy Analyst

Jonathan McGrath, PhD, serves as Senior Policy Analyst with the Department of Justice's National Institute of Justice, Office of Investigative and Forensic Sciences in Washington, DC.

Terra Lucas

Arkansas State Crime Lab, Forensic Chemist II

Terra Lucas earned a bachelor's degree in Chemistry with a minor in Forensic Science from Ferris State University, Big Rapids, MI. She began her forensics career as a Crime Scene Specialist for the Little Rock Police Department in June, 2012 and then became a Forensic Drug Chemist at the Arkansas State Crime Laboratory in November, 2014. Terra has served on the Admission Committee for SWAFS since 2016 and is the current Chair of the Meeting Advisory Committee. She became a Drug Analysis Fellow with the American Board of Criminalistics in 2018, became certified and competent as a Clandestine Laboratory Chemist in 2020, and is a member of Clandestine Laboratory Investigating Chemists Association, serving as their Historian and a member of the Electronic Resources Committee. In addition to her role as a forensic chemist, Terra performed method development and validations for a THC Quantitative method and a THC Semi-Quantitative method and trained chemists in her lab system to employ both analytical techniques.

Dr. Peter Stout

Houston Forensic Science Center, CEO and President

Dr. Peter Stout, HFSC's CEO and president, initially joined the agency in 2015 as its chief operating officer and vice president. He has more than 15 years of experience in forensic science and forensic toxicology. Prior to joining HFSC, Dr. Stout worked as a senior research forensic scientist and director of operations in the Center for Forensic Sciences at RTI International. Dr. Stout also has served as president of the Society of Forensic Toxicologists

(SOFT). He represented SOFT in the Consortium of Forensic Science Organizations and has participated in national policy debates on the future of forensic sciences in the United States. Dr. Stout has a doctorate in toxicology from the University of Colorado Health Sciences Center in Denver. Dr. Stout also served as an officer in the U.S. Navy Medical Service Corps.

Kristen Mauldin

Head of Toxicology section at the Arkansas State Crime Laboratory

Kristen Mauldin received her Bachelor of Science in Biology from the University of Central Arkansas in 2007. She then began employment at the Arkansas State Crime Laboratory in 2008 as a subpoena coordinator. Two months after, Kristen was promoted to a Forensic Toxicology position at the lab and served in various roles within the section. She received a Greenbelt certification in Lean Six Sigma and certification in Internal Auditor and International Assessor Training through ASCLD/LAB. Kristen has been leading the Toxicology section at the Arkansas State Crime Laboratory since the beginning of 2015.
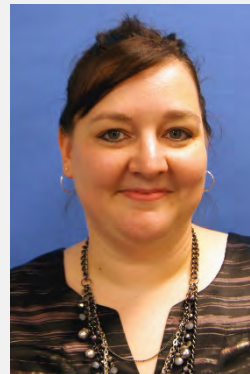
Ryan Strand

CODIS LIMS Specialist, Crime Laboratory Service, Texas Department of Public Safety


Ryan Strand is the CODIS LIMS Specialist for the Texas Department of Public Safety (DPS) Crime Laboratory Service. Ryan has a Bachelor of Science degree in Anthropology from Texas State University and a Master of Science degree in Human Biology from the University of Indianapolis. Before joining the CODIS Program at DPS in 2018, he assisted South Texas law enforcement and non-governmental agencies with DNA collection for missing persons investigations. Ryan worked for two years at DPS as the CODIS Interagency Liaison where he was responsible for assisting and training agencies with DNA collections for the CODIS Program, as well as determining the eligibility of samples submitted to the program. As the LIMS Specialist, Ryan helps manage the LIMS system while assisting with various data-driven projects around the lab.

Jennifer Clay

Houston Forensic Science Center, CODIS administrator

Jennifer Clay is the Houston Forensic Science Center's CODIS administrator. A native Houstonian, Jennifer started her career with the Houston Police Department's Crime Laboratory after graduating in 2004 from the University of Houston-Clear Lake. She was part of the laboratory's transition from the Houston Police Department Crime Laboratory to what became HFSC, one of the nation's first independent crime laboratories. Ms. Clay has spent 14 years in forensics, dedicated to seeking justice and giving back to her community. Ms. Clay has participated in two HFSC lean six sigma projects, one for the forensic biology/DNA section and a second focused exclusively on gaining efficiencies in the CODIS process. Ms. Clay is a mother of two and enjoys presenting to students in the Houston area about forensics to teach them about the rewarding and impactful career path this offers.
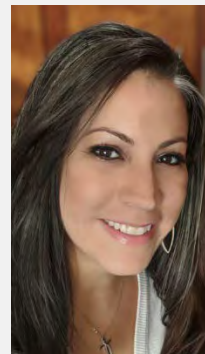
Robert Thomas

Scientific Solutions Educational Consulting Company, Principal

Rob Thomas is the principal of Scientific Solutions, an educational consulting company that serves the training and writing needs of the trace element user community. He has worked in the field of atomic and mass spectroscopy for more than 45 years, including 24 years for a manufacturer of atomic spectroscopic instrumentation. He has served on the American Chemical Society (ACS) Committee on Analytical Reagents (CAR) for the past 20 years as leader of the plasma spectrochemistry, heavy metals task force, where he has worked very closely with the United States Pharmacopeia (USP) to align ACS heavy metal testing procedures with pharmaceutical guidelines. Rob has written over 100 scientific publications, including a 15-part tutorial series, A Beginners Guide to ICP-MS. He is also the editor and frequent contributor of the Atomic Perspectives column in Spectroscopy magazine. In addition, Rob has authored three textbooks on ICP-MS and in 2018 completed his fourth book, entitled Measuring Elemental Impurities in Pharmaceuticals. He has spent the past two years researching and writing a new book, Measuring Heavy Metal Contaminants in Cannabis and Hemp which is being published in September, 2020. Rob has an advanced degree in analytical chemistry from the University of Wales, UK, and is also a Fellow of the Royal Society of Chemistry (FRSC) and a Chartered Chemist (CChem).

Dr. Markus Roggen

CEO, Complex Biotech Discovery Ventures

Dr. Mark Roggen's latest project, Complex Biotech Discovery Ventures, is a fundamental research laboratory and CRO for the cannabis and hemp industries. His research interests lie in the metabolite composition and behavior throughout the production cycle, extraction optimization, and development of innovative therapeutic formulations. Dr. Roggen received his M/Sci degree from Imperial College, London, UK in 2008. He then pursued his graduate degree in organic chemistry at the Federal Institute of Technology in Zürich (ETHZ), where he received his PhD in 2012. Dr. Roggen was awarded a DAAD postdoctoral fellowship to pursue further training in physical organic chemistry at The Scripps Research Institute in La Jolla from 2013-2014.

Dr. Roggen is also a trusted advisor and mentor to multiple startups, startup accelerators, and organizations. Positions include advisory positions at Bloom Automation, a cannabis robotics company, and former SAB member at MediPharm Labs, a Canadian LP, and co-chair of the NCIA Scientific Advisory Committee.

Erika Ziemak

Houston Forensic Science Center, Quality Division Director

Erika Ziemak, HFSC's quality division director, joined HFSC in 2017 as a quality specialist and promoted to director in 2019. Ms. Ziemak leads a team of seven people who oversee the laboratory's accreditation, blind proficiency, and internal audit programs. She previously worked for 17 years as a forensic biology/DNA analyst experienced in serological methods for the detection of semen and blood, extraction, amplification and other scientific methods related to the testing and interpretation of biological evidence. Ms. Ziemak has a master's in forensic science from Pace University in New York City.

Kirk Lokits

Agilent Technologies, GCMS Applications Scientist

Kirk received his B.S. in Forensic Science and Chemistry from Eastern Kentucky University and began working as a Forensic Drug Chemist in the Miami Valley Regional Crime Laboratory in Dayton, Ohio. He then moved to Orlando, Florida where he worked as a Forensic Toxicologist for the Florida Department of Law Enforcement in the Orlando Regional Crime Laboratory and later a Crime Analyst Supervisor in the Pensacola Regional Crime

Laboratory. Kirk left the forensic realm and began his tenure with Hewlett Packard/Agilent Technologies, working as a Customer Service Engineer (CE) supporting the LC, GC, LCMS, GCMS, and ICPMS products. While working for HP, Kirk earned his M.S. in Chemistry from Middle Tennessee State University and in 2005 Kirk left Agilent Technologies to attend the University of Cincinnati and earned his Ph.D. in Analytical Chemistry. After receiving his Ph.D., Kirk worked for the Midwest Research Institute (MRI) in Kansas City, MO where he worked as a Principal Chemist and Sr. Program Manager on Department of Defense projects, staffing, designing, and building remote laboratories for placement throughout the world. In 2014, Kirk re-joined Agilent Technologies as a GCMS Applications Scientist focusing on forensic applications.

Tamara Keller

Waters Technologies, Chemistry Specialist

Tamara graduated from Northern Arizona University in 1995 with a BS in Forensic Chemistry (Criminalistics). She joined the Drug Enforcement Administration's South Central Laboratory in 1997 and continued her career until retirement in 2015. She is very active in the Southwestern Association of Forensic Scientist (SWAFS) organization, where she was on the Board of Directors from 2005-2007, 2008-2010, 2011-2013, President-Elect 2014, President 2015, Chairman of Board, and currently Secretary. After retirement, she joined Waters Technologies as a Chemistry Specialist and assists customers with chromatography challenges.

Dr. Marc LeBeau

FBI Laboratory, Senior Forensic Scientist of the Scientific Analysis Section

Marc A. LeBeau, PhD, is a Senior Forensic Scientist of the Scientific Analysis Section of the FBI Laboratory. He has worked as a Forensic Chemist and Toxicologist for the FBI since 1994 and has testified in federal, state, and county courts throughout the United States.

Dr. LeBeau holds a Bachelors degree in Chemistry and Criminal Justice from Central Missouri State University (1988) and a Master of Science degree in Forensic Science from the University of New Haven (1990). He was employed in the St. Louis County Medical Examiner's Office (1990-1994), before beginning his career with the FBI. In 2005, he received his Doctorate in toxicology from the University of Maryland – Baltimore.

As a Fellow of the American Board of Forensic Toxicology, Dr. LeBeau is active in numerous scientific organizations. He serves as the current President of The International Association of Forensic Toxicologists (TIAFT) and is a Fellow of the American Academy of Forensic Sciences

(AAFS). Additionally, Dr. LeBeau is a member and Past-President of the Society of Forensic Toxicologists (SOFT).

Dr. LeBeau has spent much of his career helping to advance the forensic sciences. He has served as a Commissioner on the National Commission on Forensic Science, the chairman of the Scientific Working Group on the Forensic Analysis of Chemical Terrorism (SWGFACT), and co-chair to the Scientific Working Group on the Forensic Analysis on Chemical, Biological, Radiological, and Nuclear Terrorism (SWGCBRN). He was also a co-chair of the Scientific Working Group for Forensic Toxicology (SWGTOX). He is currently the Toxicology Subcommittee Chair of the Organization of Scientific Area Committees (OSAC) and Chair of the AAFS Standards Board's Toxicology Consensus Body.

In 2004, Dr. LeBeau won the FBI Director's Award for Outstanding Scientific Advancement, the 2008 End Violence Against Women (EVAW) International Visionary Award, and the Alexander O. Gettler Award from the Toxicology Section of the American Academy of Forensic Sciences in 2015.

Lindsey Bynum

Texas Department of Public Safety, Fire Debris Section

Lindsey Bynum graduated from Xavier University in 2012 with a B.S. in Chemistry and a minor in German. After completing graduate coursework in analytical chemistry at Michigan State University, she moved down to Texas to work in the Trace Evidence Section with the Texas Department of Public Safety in 2013 where she conducted examinations with hair, fiber, paint/polymer, and impression evidence. In 2018, she transferred to the Fire Debris Section and has been enjoying her time there ever since.
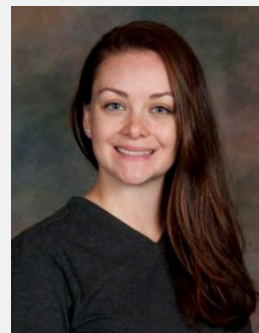
Sarah Pryor

Texas Department of Public Safety Crime Laboratory, Forensic Document Examiner

Sarah Pryor has been with the Texas Department of Public Safety Crime Laboratory for almost 15 years, 13 of which have been as a Forensic Document Examiner. She has a Bachelor of Science degree in Forensic Science from Baylor University (Sic 'em Bears).

In 2009, Sarah completed her in-house Forensic Document Examination training at the Texas Department of Public Safety Crime Laboratory under the supervision of three examiners with a

total of over 75 years of experience in the field. She now serves as the Forensic Document Examination Technical Point of Contact and Subject Matter Expert for the laboratory.

Sarah has educated many audiences on the topic of Forensic Document Examination. She has lectured various law enforcement agencies, including police departments, sheriff's offices, and the Texas Department of Criminal Justice. She has also had the opportunity to address several educational institutions, including Baylor University and the University of Texas at Austin. She served as an adjunct professor for the graduate program in Forensic Science at Sam Houston State University.

Sarah is a member of the International Association for Identification (IAI) and serves as a technical assessor in Forensic Document Examination for ANAB.

Dr. Jarrad Wagner

Oklahoma State University Center for Health Sciences, Professor of Forensic Sciences

Dr. Jarrad Wagner is a Professor of Forensic Sciences at the Oklahoma State University Center for Health Sciences where he specializes in research and instruction in Forensic Toxicology and Chemistry. He is board certified as a Fellow of the American Board of Forensic Toxicology and an Associate Editor for the Journal of Analytical Toxicology. Jarrad is a SWAFS member and is the immediate past-president of CLIC (Clandestine Laboratory Investigating Chemists). He works with tandem mass spectrometry (LC/MS/MS) ang gas chromatography/mass spectrometry (GC/MS) instruments and supports forensic and clinical laboratories in method development, validation, and training. He serves as a member of the AAFS/SOFT Drugs and Driving Committee, the AAFS/SOFT Oral Fluid committee, is a member of the National Safety Council Alcohol, Drugs and Impairment Division and is the Vice Chair of the Oklahoma State Board of Tests for Alcohol and Drug Influence.

In addition to his work in Forensic Toxicology, Dr. Wagner also supervises research in trace evidence and chemical residue analysis. He also provides training to federal, state, and local personnel on the recognition of Weapons of Mass Destruction (WMD) clandestine laboratories, namely those of a Chemical, Biological, Radiological, Nuclear, or Explosive (CBRNE) nature. Professor Wagner formerly served as a Chemist in the Hazardous Materials Response Unit of the FBI Laboratory, where he specialized in crime scene investigations involving hazardous materials throughout the world. While the scenes varied, frequently they involved clandestine laboratories where the synthesis of CBRNE was a concern. His training and experience have led to his leadership in the area of differentiation between CBRNE and Drug (D) laboratories, which is critical for investigator safety and accurate threat assessment. He has served on numerous committees in his Subject Matter Expert role as a Chemist.

Prior to the FBI, his law enforcement experience includes his time as a Forensic Scientist in the

Toxicology section of the Orange County (CA) Sheriff-Coroner's office and his service as a Reserve Police Officer in the City of Irvine, CA. He is a former Assistant Professor of Chemistry and Director of the Forensic Sciences program at California State University, Fresno. Dr. Wagner earned a Ph.D. in Environmental Toxicology from the University of California at Irvine and undergraduate degrees in Biology and Chemistry.

Dr. Austin Ciesielski

Oklahoma State University Center for Health Sciences (OSU-CHS) Forensic Toxicology and Trace Laboratory, Postdoctoral Researcher

Dr. Austin Ciesielski is a postdoctoral researcher in the Oklahoma State University Center for Health Sciences (OSU-CHS) Forensic Toxicology and Trace Laboratory, where his focus is the characterization and remediation of clandestine laboratories. Additionally, Dr. Ciesielski is experienced as a general supervisor, technical supervisor, and testing personnel in high complexity clinical toxicology laboratories. He has a background in method development and validation using gas chromatography/mass spectrometry (GC/MS) and liquid chromatography with tandem mass spectrometry (LC-MS/MS). He is a member of the American Academy of Forensic Science (AAFS) in the Criminalistics section and a member of the Society of Forensic Toxicologists (SOFT). Austin earned his MS and PhD degrees in Forensic Science at OSU CHS in Tulsa, OK. Prior to that, he earned his BA in Chemistry and Biochemistry from Coe College in Cedar Rapids, IA.
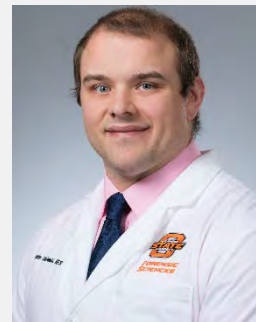
Jerry Peña

Houston Forensic Science Center, Director of the Crime Scene Unit/Multimedia Evidence Section

Jerry Peña is director of HFSC's Crime Scene Unit/Multimedia Evidence Section. Prior to coming to HFSC, Mr. Peña served for 18 years as assistant director of the Austin Police Department's Forensic Science Division. In that role, Mr. Peña was instrumental in transitioning APD's Crime Scene Unit into a civilian operation. He also helped the department's crime scene unit become the first in Texas to achieve ASCLD/LAB accreditation. Mr. Peña is a U.S. Army veteran and has worked as a peace officer in Nueces County and as a crime scene investigator with the Corpus Christi Police Department.

Dr. Kevin He

SCIEX, Senior Manager for Applications in Clinical Research and Forensics

Xiang (Kevin) He received his Ph.D. in Chemistry from State University of New York at Stony Brook in 2002 and moved to University of California San Francisco for a Postdoctoral Fellowship with Paul Ortiz de Montellano, focusing on studies with cytochrome P450/drug metabolism. He then took a position in 2005 at Pharmaceutical Product Development (PPD) as a Scientist working on LC-MS/MS-based biomarker discovery sciences, focusing on metabolomics. In 2010, he moved to a mass spectrometry manufacturer and worked as a marketing specialist specializing in the LC-MS/MS applications in clinical research and forensic toxicology. At the end of 2012, he moved to SCIEX where he is now Senior Manager for applications in clinical research and forensics, as well as Redwood City Demo Lab.

Sarah Olive

Shimadzu Scientific Instruments, Mass Spectrometry Technical Support Scientist

Sarah Olive is a Mass Spectrometry Technical Support Scientist for Shimadzu Scientific Instruments. She has a Master's Degree in Forensic Science and has spent her career utilizing LC/MS-MS instrumentation in the forensic toxicology, clinical toxicology and pharmaceutical drug discovery arenas. Prior to Shimadzu, she worked at the Dallas County Institute of Forensic Sciences for over seven years in the forensic toxicology section.

Kevin Sontag

Arkansas State Crime Lab, Forensic Serologist

Kevin Sontag is a native Arkansan and has had a varied career in his life. He has been a soldier in the Army, served an infertility clinic as an Embryologist, and has even owned and managed a small construction company. Since 2009, he has been working in the Physical Evidence section of the Arkansas State Crime Lab as a Forensic Serologist and is one of the senior serologists on the Physical Evidence team. He is a graduate of Hendrix College with a Bachelor of Arts Degree in Biology.
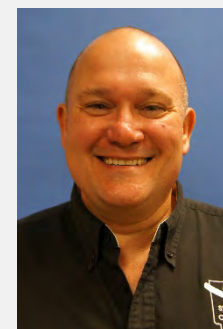
Aimee Grimaldi

Houston Forensic Science Center, Project Engineer

Aimee Grimaldi is a project engineer at the Houston Forensic Science Center where she leads process improvement initiatives for the organization. Aimee has 10- years of forensic biology/DNA experience and four years of project management experience. Aimee is an ASQ Certified Six Sigma Black Belt and Certified Quality Auditor (ASQ-CQA). She holds a master's degree in forensic DNA and serology from the University of Florida.

Paula Evans

Houston Forensic Science Center, Project Engineer

Paula Evens is a project engineer at the Houston Forensic Science Center where she leads process improvement initiatives for the organization. Paula has five years of forensic science experience in the forensic biology and latent print disciplines and four years of project management experience. Paula holds a bachelor's degree in forensic biology from Virginia Commonwealth University, and is an ASQ Certified Six Sigma Black Belt and a Certified Quality Auditor (ASQ-CQA).