



S.A.T. Newsletter

March 2005

Volume 27, Issue 1

Spring Meeting Highlights

- "Alcohol, Drugs, the Law, and Forensic Labs"
- Sixth Floor Museum
- MLB: Rangers v. Red Sox

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News of the Southwestern Association of Toxicologists (est. 1977)



S.A.T. to meet in Big D April 28-30

You are cordially invited to attend and participate in the 2005 Spring Meeting of the Southwestern Association of Toxicologists. The meeting will be held April 28-30, at the Sheraton Suites close to downtown Dallas.

The theme of our spring meeting will focus on recent legislative events involving alcohols, drugs, laws and our labs. While most of us have little or no control over what the legislature does, their decisions affect us all as citizens and as scientists. The courts are looking to us to explain our results in the context of the law when the law itself may not make a whole lot of sense. This will be an interactive event that hopefully will help us all understand how we are involved in the law (like it or not).

If there is enough interest we will try and attend a baseball game at the Ballpark in Arlington. It is a great baseball experience. Friday April 29, 2005 the Rangers will play the World Champion Boston Red Sox. Another interesting place to visit is the Sixth Floor Museum. This details everything you ever wanted to know about President John F. Kennedy. It is in the old Book Depository Building in downtown Dallas (West End Marketplace). There are group rates available if you are interested. Please indicate your interest on the registration form.

Join old friends and meet new ones at the President's Reception Thursday evening from 6:30 p.m. to 8:30 p.m.



Sheraton Suites Market Center
Dallas, Texas

Hotel Information

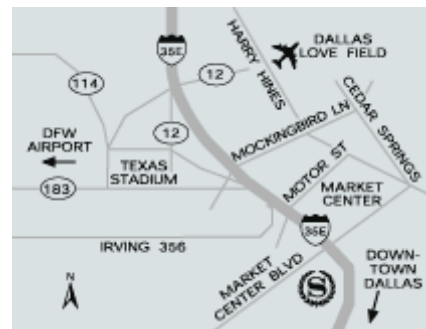
Our Spring Meeting of the Southwest Association of Toxicologists will be held near downtown Dallas at the Sheraton Suites Hotel, 2101 Stemmons Freeway, Dallas, Texas 75207

Phone: 214-747-3000 or 800-325-3535

[Sheraton Suites Market Center](#)

Rooms are available to meeting attendees at a special rate of \$85.00 (15% tax not included) per night for a suite. Each Suite contains a king bed and a double pull out sofa. Reservations must be made no later than April 7, 2005. When making reservations, you must identify yourself as an attendee of the meeting of the Southwestern Association of Toxicologists.

Questions? Please contact Chris Heartsill or Sandra Grey at 214-920-5966 or 5809, or email at cheartsill@dallascounty.org.



"I believe that legislation within the next few years will have an impact on the laboratories of SAT members."

Glenn Harrison, Texas
DPS



American Airlines Center

DUID LEGISLATION IN TEXAS

By Glenn Harrison, Texas DPS

The Texas Legislature is currently in session dealing with spotlighted issues in government finance, public education, and health. One of the many bills for consideration is House Bill 374 proposed by Representative Burt Solomons. The subject is "Relating to the operating of a motor vehicle while having certain amounts of certain controlled substances in the body." If passed, this legislation will have a big impact on expert testimony and analytical methods in toxicology laboratories in our state.

Representative Solomons also authored HB 7 as an extensive modification of the worker's compensation system in Texas. In research of those laws in other states, he found language regarding drug testing of employees and adapted that language to apply to the definition of "intoxication" of drivers with drugs in the penal code. The text is available online:
http://www.capitol.state.tx.us/tlo/79R/bill_ext/HB00374I.HTM

I posted information to the SAT list mail and requested feedback to aid me in responding to a request for how passage into law would impact our laboratory. I appreciated all your responses. Those responses are available to SAT members on the SAT List Mail server at <http://groups.yahoo.com/group/sat-tox/>. Many of you contacted Representative Solomons to give your direct input for his consideration. A summary of input follows:

"The proposal is to use a test (enzyme multiplied immunoassay technique) that has not been approved for positive identification in Texas courts. Cross-reactivity in immunoassay testing can lead to false positives and poor response of some drugs within a class could lead to false negatives. Some labs within Texas are using other screening techniques and would not produce prosecutable results. Development in forensic science laboratories would be limited with the restriction to one technique. It is standard practice in the forensic field to follow immunoassay testing with an appropriate confirmation test.

Cont. on p. 6

TENTATIVE MEETING SCHEDULE

Thursday, April 28, 2005

3:00 p.m. – 6:00 p.m.	Registration
6:30 p.m. – 8:30 p.m.	President's Reception
8:30 p.m.	Dinner & Entertainment on your own

Friday, April 29, 2005

8:00 a.m.	General Business Meeting
9:00 a.m. – 12:00 p.m.	Alcohol, Drugs, the Law and Forensic Labs
12:00 p.m. – 1:00 p.m.	Lunch
1:00 p.m. – 2:00 p.m.	Open Discussion
2:00 p.m. – 5:00 p.m.	Scientific Sessions
5:00 p.m.	Entertainment & Dinner on your own

Saturday, April 30, 2005

8:30 a.m. – 12:00 p.m.	Scientific Sessions
12:00 p.m.	Conclusion

President's Message – Phil Kemp

Hello friends and colleagues. I hope all is well with everyone. Well, here I am sitting in my office on a rainy Tuesday afternoon thinking about what I've accomplished today. The pace around our office has been running at a feverish tempo. To understate the issue, we've been busy. A heavy caseload and preparation for accreditation have kept us hopping. I know that all of you have been just as swamped. I suppose all of this is good. Job security is a good thing as my eldest son prepares for attending the University of Oklahoma (or are they preparing for him?). Son number 2 and daughter are not far behind.

The meeting in Oklahoma went well. I hope everyone had a great time. I think we all benefited from hearing the experiences of Dr. Sunshine, Dr. Dubowski, and Joe Castorena.

Thanks to all who contributed to the program. Some new developments are that we have a new historian for SAT. Chris Heartsill has volunteered to put together a history collection for our organization. Mike Frontz is our new editor for the SAT newsletter. The newsletter is going electronic. Look for it on the website. We are excited about the organization and hope that you, the membership, will get involved in some way. If you have a new idea that will benefit SAT, let us know about it.

It seems like only yesterday that we were all gathered in Oklahoma City. It is time to make your arrangements for Dallas! Chris Heartsill and his crew are diligently working on putting together a fine program. I know he needs help in many ways, not the least of which is the scientific program. Get your papers together and let him know you will pitch in with a presentation. See ya there!



The Ballpark in Arlington



Sixth Floor Museum

Meeting Registration

SOUTHWESTERN ASSOCIATION OF TOXICOLOGISTS
 2005 Spring Meeting
 April 28-30, 2005
 Sheraton Suites Marketplace Hotel
 Dallas, Texas

REGISTRATION FORM

Name (as it will appear on badge) _____

Phone: _____ FAX: _____ Email: _____

Title: _____

Agency: _____

Address: _____

SAT Member [] Non-Member []

MEETING REGISTRATION:

Please register by April 7, 2005 to avoid late fees! Registration includes admission to all scientific sessions, workshops, exhibits, and the President's Reception.

	Member	Non-member	Student	Total
Prior to/on April 6th:	\$50.00	\$55.00	\$15.00	_____
After April 6th:	\$55.00	\$65.00	\$25.00	_____

Extra Meal Tickets \$25.00

TOTAL ENCLOSED: _____

I plan to attend the Tour of the Sixth Floor Museum Yes [] No []

I plan to attend the Texas Ranger Baseball game Yes [] No []

Please make payment by check or money order, payable to SAT, and mail to:

Chris Heartsill
 Southwestern Institute of Forensic Sciences
 5230 Medical Center Drive
 Dallas, TX 75235

HOTEL INFORMATION:

Sheraton Suites Marketplace Hotel
 2101 Stemmons Freeway
 Dallas, Texas 75207

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Phil Kemp

*"If you have a new idea
that will benefit SAT, let
us know about it."*

-Phil Kemp



Southwestern Association of Toxicologists

How do I...

...send a group E-mail?

Send your message,
comments, news, etc. to
Sat-tox@yahoogroups.com

...notify of an address
change?

Contact our secretary,
Monica Lopez at (214) 920-
5809 or
mlopez@dallascounty.org

We're on the Web!

See us at:

www.sat-tox.org

DUID LEGISLATION cont.

"The proposal is to use a test of urine that would indicate drug usage prior to the incident and would not prove intoxication at the time of the incident. Urine is not an accurate predictor of the degree of impairment. Blood is the preferred specimen for impairment evaluation.

"The proposal with levels of drug classes can lead to difficulties in prosecuting cases with lower concentrations. The concentration levels proposed have not been correlated to driving impairment in studies. The levels detected can vary based on the chosen calibrator drug and its response relative to other drugs within the class.

"The proposal, by specifying urine testing, could result in officers choosing to take urine rather than blood in driving cases. Then the lab would be testing urine for alcohol concentration with less accurate results in corresponding to the level of intoxication than blood. In mandatory cases, the person only has to give one type of sample.

"The proposal includes inconsistent language that needs improvement if it is to be used in law. The phrase "having one of the following controlled substances" is followed with a list of classes of drugs responding to the test. It would need to be modified to "having a drug from one of the following classes". The phrase "in the body" should be deleted since a urine test is specified.

"The proposal to use classes of drugs could lead to prosecution of individuals using over the counter drugs that don't have the impairing level of the major drugs in the specified classes. It could also allow prosecution of individuals when the drug was no longer effective in the blood but remained in the urine."

The bill was referred to the Criminal Jurisprudence committee early in February. You can follow the status at the Texas Legislature Online site:

<http://www.capitol.state.tx.us> and enter "HB374" to search. In communication with staff of Representative Solomons, it is my understanding that they are waiting for a consensus for improvement of the proposal before requesting further committee action.

I was informed of federal legislation proposed in the previous session of Congress that would require states to adopt a model statute dealing with drug impaired driving. Text can be found at <http://thomas.loc.gov/home/search.html> by selecting the 108th Congress and searching for HR 3922. The bill was titled "Drug Impaired Driving Enforcement Act of 2004" and was referred to various committees in March, 2004.

I believe that legislation within the next few years will have an impact on the laboratories of SAT members. Stay informed and be prepared to provide your expertise to help shape the law to protect society and to allow efficient operation of your laboratory in support of that law.

Welcome New Members!

S.A.T. would like to extend a warm welcome to the following individuals:

Robert Bost, PhD

Kacey Cliburn

Lydia Harryman

Jo-Cheih "Lily" Juan

Tom Kupiec, PhD

Garry Metcalfe

In Memoriam – Rebecca Elledge



We were saddened to learn that Becky Elledge passed away suddenly, but peacefully in her sleep on June 8, 2004. She worked as a Medical Technologist at Hermann Hospital in Houston, then moved to the Joseph A. Jachimczyk Forensic Center in Houston in 1987 where she was an Assistant Toxicologist until she retired in April, 2002. While at the Forensic Center, she also was employed part time as the QA/QC officer for Southwest Toxicology (which was subsequently bought by LabCorp). As her Career progressed, Becky became active in SAT. She was an enthusiastic member, serving as Treasurer and President; always willing to go the extra mile to lend a hand. She maintained an active personal life by doing the things she enjoyed: an active member of Mystery Writers, taking guitar lessons, a member of Toastmasters. Becky was always a hard worker with a ready smile and friendly attitude, and will be greatly missed by her friends and colleagues.

Lynn DeCuir
Toxicology Section Leader
Office of the Medical Examiner
Joseph A. Jachimczyk Forensic Center
1885 Old Spanish Trail

ABSTRACTS – OKLAHOMA CITY, FALL 2004

An Old Technique – A New Application

Joe Castorena MS

Bexar County Medical Examiner's Office

San Antonio, Texas 78229

Technological advances in analytical instrumentation, development of new methods and proper validation of methods has propelled the modern forensic laboratory to new heights in accuracy and confidence in reported results when compared to the methods being used only twenty five years ago. In spite of these advances, an age-old issue still exists when performing quantifications when commercial controls are not available. The issue of stability and deterioration of reference materials and stock solutions has always been a concern. A model QA/QC process will be presented which will ensure the highest degree of confidence when using these materials.

Introduction and Applications of Pharmacogenomics for the Forensic Toxicologist

Thomas C Kupiec, Vishnu Raj, Nicole Vu

ARL, Oklahoma City, Oklahoma

People respond differently to similar doses of a drug. A person may have adverse effects with a certain drug, and another individual may not even be affected. These variations in response are basically due to differences in individual genetic makeup. Genes are made of DNA sequences, which are multitude of 4 units or base pairs: Adenine, Guanine, Cytosine and Thymine. If these sequences are disrupted even at a single base pair, it may lead to major differences in form or function. A polymorphism is an alternative form resulting from changes in genetic structure i.e., eye or hair color. Differences in base pair sequences can lead to observable variations.

Pharmacogenetics is the study of the impact of inherited genetic differences on drug disposition and metabolism. Historically, pharmacogenomics has been around for centuries. Some of the applications of Pharmacogenomics include, molecular diagnostics, optimized drug therapy, and pre-determination of drug efficacy and toxicity.

A single base pair difference in a DNA sequence is termed a single nucleotide polymorphism (SNP). Some SNPs have been known to affect drug disposition, and thus an individual's SNP profile would provide valuable information about their possible drug responses. Polymorphisms in the CYP 450 enzyme system, can lead to inter-individual differences in response to the same dosage of a drug. The CYP 450 enzyme system is responsible for the metabolism of the majority of drugs. CYP2D6 metabolizes 25-30% of all drugs, and it is also the most polymorphic CYP 450 enzyme.

Drug testing is an integral part of the workplace screening procedure, ongoing treatment programs, and forensic investigations. In forensic toxicology, pharmacogenomics may play a vital part, especially in deaths attributed to lethal drug levels. Pharmaceutical drugs are commonly implicated in overdose related death and the subsequent liability issues. An example of this is oxycodone, a narcotic analgesic responsible for a significant number of drug related fatalities. Oxymorphone is a major active metabolite of oxycodone, and it has significant pharmacological activity. Although oxycodone has definite drug abuse potential, differential metabolism may also play a part in high postmortem drug levels. CYP2D6 is the polymorphic enzyme responsible for the metabolism of oxycodone. Although majority of the population exhibit high CYP2D6 activity, 5-10% of Caucasians and 1-4% of most other ethnic groups have decreased CYP2D6 activity leading to an increased risk of toxic effects and possible fatality from routine doses of oxycodone.

Depending on the specific polymorphism, CYP2D6 may exhibit variable activity in different individuals, ranging from ultra-rapid metabolism to poor metabolism, correlating clinically into therapeutic inefficiency or toxicity. Individuals with decreased levels of this enzyme would experience adverse effects and possibly death.

Methadone is another opioid drug that has abuse potential. Methadone is commonly used to treat opioid withdrawal symptoms, however, there is a significant overlap between therapeutic and lethal methadone doses, and serum methadone concentration alone would not be predictive of fatality. The half-life of methadone ranges from 15 to 55 hours, and it is metabolized by CYP 1A2, 2D6 and 3A4. Polymorphisms of the CYP2D6 enzyme may play a part in differential methadone metabolism. A poor metabolizer genotype would be expected to metabolize the drug relatively slower, thus leading to methadone accumulation reaching toxic levels. Diagnosis of methadone toxicity should be made in conjunction with autopsy findings, medical history and crime scene investigation. Interpretation of postmortem drug levels must be tempered with knowledge of possible pharmacogenomic influence on drug metabolism. Genotyping as an aspect of toxicology may serve as a useful adjunct for establishing cause of mortality.

Comparison of Two Analytical Methods for Topiramate in Postmortem Specimens

*Metcalfe G, Kemp P, Harty L, Curtis B.
Office of the Chief Medical Examiner
Oklahoma City, Oklahoma 73117, USA.*

Topiramate (Topamax) available since 1988, is a drug used to control epileptic seizures. There is little information in the literature on the analysis of this drug in medical examiner cases. In an effort to maximize extraction accuracy and precision, two quantitative methods were compared in side-by-side analyses. Topiramate is detected in our laboratory on the acid/neutral screen. The quantitative method, therefore, consists of acidifying the samples with phosphate buffer (pH 5.5) followed by micropartitioning and analysis by gas chromatography/flame ionization detector (GC/FID). The temperature programming for the samples analyzed by GC/FID was 160°C-300°C with a rate of 20° per minute. For comparison, a previously published method was chosen that involves the alkalization of the samples with borate buffer (pH 9.5) followed by liquid-liquid extraction with ethyl acetate and analysis by gas chromatography/mass spectrometry (GC/MS) using selective ion monitoring. The temperature programming for the published method was 50°C-100°C at a rate of 50°C per minute. A second ramp of 100°C-285°C at a rate of 20°C per minute was also used. A 5.0 mcg/mL control was prepared in blood and stored at -4°C. Over a period of 1 month, this control was analyzed in duplicate by GC/FID and GC/MS using the two extraction methods described above. The average result from the in-house method, with GC/MS analysis, is 4.7 mcg/mL. The average result for the in-house method, with GC/FID analysis, is 4.5 mcg/mL. The average result using the published method, with GC/MS analysis, is 5.7 mcg/mL. The average result for the published method, with GC/FID analysis, is 5.5 mcg/mL.

Investigation into the Degradation of Olanzapine in Liver, Blood, and Water During Storage

*Kacey Cliburn, Reagan Lee, Phil Kemp
Office of the Chief Medical Examiner
Oklahoma City, Oklahoma*

The present study was done to evaluate the degradation of olanzapine in liver, blood, and water. Blood and liver homogenate (1:4 in water) were screened by gas chromatography to ensure negativity for olanzapine. The liver homogenate was spiked with olanzapine to a total concentration 1.0 mcg/g homogenate or 4.0 mcg/g liver, while the blood and water were spiked with olanzapine to a concentration of 1.0 mcg/mL. The homogenate, blood, and water were

aliquoted into 20 glass tubes and placed into the freezer (-20°C). The remaining homogenate, blood, and water were placed into cups in the refrigerator (-4°C). Over a period of 12 days, analysis was done, in duplicate, on the frozen aliquots and the refrigerated samples. The olanzapine was quantitated by a basic liquid-liquid extraction followed by analysis on a gas chromatography with nitrogen-phosphorous detection. The results showed a 50% drop in the refrigerated liver homogenate concentration by Day 7 with a total drop of 75% by Day 12. The frozen liver homogenate did not show a significant decline in the concentration of olanzapine over the course of the study. The refrigerated blood samples showed a 25% drop in concentration at the end of Day 12 while the refrigerated water samples showed a 36% decline in concentration. The frozen blood aliquots had a decline in concentration of 29% by Day 12 and the frozen water aliquots showed a 22% drop in concentration at the end of the study. These results indicate that a drop in olanzapine concentration is noted in both refrigerated blood and refrigerated liver over a short period of time. A case with olanzapine should be evaluated quickly from the time the specimen is received and should be frozen to keep olanzapine from undergoing significant degradation during storage.

Exploring the Future – Forensic Science Students

*Robert O. Bost, Ph.D., DABFT
Associate Professor of Chemistry, and
Director, Master of Science in Forensic Sciences
University of Central Oklahoma*

Previous speakers have discussed the history and development of forensic toxicology. This presentation will review the “Family Trees” of forensic toxicologists, bringing the past to the present. University programs are currently available to train the future forensic scientists, and the program at UCO will be described. Some mention will be made of programs at other schools. Some brief mention of future areas of interest and research may be included.

DEVELOPMENT OF THE FIRST STATE WIDE MEDICAL EXAMINER SYSTEM

*John W. Soper
Toxicology and Accident Research Laboratory
FAA Civil Aerospace Medical Institute
Oklahoma City, OK, U.S.A.*

The first formal statute after Magna Carta dealing with the coroner is that of Edward the Confessor in 1276. The coroner law of Maryland dates back to 1666, and operated continuously for 273 years. A law in 1868 allowed the governor to appoint a physician as the coroner for Baltimore City.

The first US Medical Examiner system was established in Boston in 1877, then inaugurated in New York City in 1918.

The National Research Council stated in July, 1928, “That duties which fall upon the coroner are not always performed in a thoroughly competent and scientific manner must be apparent to everyone who has given any thought to the subject.”

The first state wide Medical Examiner system in the U.S. was established in Maryland, in 1939. Among other things, the law provided for the following actions: “When any person shall die in Baltimore City, or in any county of the State, as a result of violence, or by suicide, or by casualty, or suddenly when in apparent good health, or when unattended by a physician, or in any suspicious or unusual manner, it shall be the duty of the police or sheriff immediately to notify the

Chief Medical Examiner...of the known facts concerning the.....circumstances of such death.....the said Medical Examiner shall go to the dead body and take charge of the same.”

The Post mortem Examiners commission was further....directed to appoint a Chief Medical Examiner, a Deputy chief Medical Examiner,...a toxicologist, two assistant toxicologists, and a serologist.

Dr. Russell Fisher served as the second Chief Medical Examiner for Maryland from 1951, until his death in 1984. During a significant portion of that time Dr. Yale Caplan served as the Toxicologist for the State. Dr. Caplan significantly enhanced the profession through his research and teaching efforts, as did Dr. Fisher. Among many other awards, Dr. Caplan has received the status of Distinguished Fellow from the AAFS.

The decade from the early 1980's through the early 1990's saw many significant developments in the role of the Medical Examiner system and the part that good toxicology plays in enhancing that system. This talk will describe some of the interesting cases and other transitions that occurred during that time, not only in Baltimore, but across the country.

HISTORY OF MEDICAL EXAMINER OFFICES

*Robert O. Bost, Ph.D., DABFT
University of Central Oklahoma*

The presentation will open with a look at the origin of death investigation systems and review the transitions that occurred and the importation of death investigation systems into America. Various jurisdictions adopted differing systems and/or modified existing systems to correct problems which were occurring. The systems in several jurisdictions will be described by the participants in this presentation. Audience questions and discussion will be invited.

The Development and Deployment of Biological Weapons; History and Consequences

Rich Hamerla Ph.D.

This talk addresses the history of biological weapons development and deployment from the ancient world through today. With Biblical sources as a starting point, the first half of my presentation summarizes the development and deployment of biological weapons from before the Common Era, continuing through the Middle Ages and the modern era. The intensified research and development that characterized the World Wars of the twentieth century are examined, followed by special consideration of the weapons programs of the former Soviet Union and the United States during the Cold War. After noting the impact of the collapse of the USSR on the world's political environment, the second half of this presentation discusses specific instances when radical groups indigenous to the United States acquired or used biological weapons, after which the likelihood of a sovereign nation using biological agents as offensive weapons is explored. Finally the possibilities and consequences of these weapons falling into the hands of contemporary terrorist organizations, the particular appeal of biological weapons to modern terrorists, and some of the principal sources of biological weapons proliferation are addressed.

Drug Testing for Pain Management Programs: What a Pain

*Michael W. Fowler, Ph.D.
Oklahoma Christian University
Department of Chemistry*

Clinical laboratories have performed drug testing for emergency rooms, drug treatment programs and occasionally for businesses as a part of workplace testing. Generally this testing involves

testing for drugs of abuse that the person has either accidentally or intentionally ingested. This task has usually been using standard immunoassays and occasionally gas chromatography or gas chromatography/mass spectroscopic procedures. In the case of emergency room testing turn-around time is of the essence. In the case of drug treatment programs cost is probably the prime consideration. In workplace testing specimen validity has become a major issue and production of legally (forensic) results if the goal.

Testing for pain management programs involves some of the same challenges as the above types of testing but also provides additional challenges especially for clinical laboratories with little or no workplace testing experience. These issues include testing for drugs not typically detected by standard immunoassays such as oxycodone and fentanyl, testing at lower cutoffs to detect low therapeutic levels such as for methadone, and monitoring specimens for substitution or adulteration. When these new challenges are recognized laboratories can make adjustments in their testing protocols to help the clinician answer the questions of whether a patient is taking the prescribed medication appropriately, whether the patient is taking (abusing) drugs that they have not been prescribed and whether the patient is "doctoring: the specimen to avoid detection of nonuse or misuse of prescribed or misuse of illicit drugs.

To meet these challenges laboratories may have implemented new technologies into everyday use such as ELISA techniques to expand the detectable drug menu and LC/MS/MS to provide the necessary detection capabilities.

EFFECTIVENESS OF FREE AND TOTAL MORPHINE CONCENTRATION AS CRITERIA FOR SELECTING URINE SPECIMENS FOR TESTING 6-ACETYLMORPHINE

*Sheng-Meng Wang^{1,2}, John W. Soper², Dennis Canfield², and Ray H. Liu^{2,3,4}, ¹Central Police University, Taoyuan, Taiwan. ²Toxicology and Accident Research Laboratory, FAA Civil Aerospace Medical Institute, Oklahoma City, OK, U.S.A. ³Department of Medical Technology, Fooyin University, Kaohsiung Hsien, Taiwan. ⁴Department of Justice Sciences, University of Alabama at Birmingham, Birmingham, AL, U.S.A. *Presenting Author*

The U.S. Department of Health and Human Services' workplace urine drug testing program has adopted a 2000 ng/mL total morphine concentration as the criterion for testing 6-acetylmorphine (6-AM). We were interested in evaluating whether such a criteria can be applied to specimens collected from workers in Taiwan, a genetically different group than the typical US worker. Two hundred and thirteen workplace specimens, testing positive for opiates by immunoassay (cutoff 300 ng/mL), were analyzed for 6-AM, and for free and total morphine, by GC-MS methods. Recovery efficiencies of extraction and hydrolysis protocols (for total morphine determination) were evaluated and used to derive analyte concentrations in test specimens. In reference to an earlier report by Paul et al [1], data hereby obtained were used to determine whether free or total morphine concentration is more effective in predicting the presence of 6-AM in 2 different concentration ranges: >10 ng/mL and 5–10 ng/mL. As shown in Table 1, 4 specimens were found to contain from 5-10 ng/mL of 6-AM, while 55 specimens were ≥10 ng/mL. This total of 59 specimens revealed the presence of 6-AM at >5ng/ml, regardless of whether total morphine (2000 ng/mL) or free morphine (50, 100, or 200 ng/mL) concentration was used as the cutoff for selecting specimens for 6-AM determination.

Table 1. Effectiveness of free and total morphine in predicting the presence of 6-AM

Analyte concn (ng/mL)	No. of specimen	No. of specimen with 6-AM concn (ng/mL)			
		>10	5.0–10	1.0–4.9	Negative [^]
<i>Total morphine</i>					
≥300	213	55 (25.8%)†	4	14	140
≥2000	162	55 (34.0%)	4	12	91
≥4000	142	55 (38.7%)	3	9	75

Free morphine

≥50	181	55 (30.4%)	4	12	110
≥100	168	55 (32.7%)	4	12	97
≥200	154	55 (35.7%)	4	11	84

^ Limit of detection: 1 ng/mL.

† Numbers inside parentheses are the percentages of the morphine positive (using the cutoff listed in the first column in respective rows) specimens that were found to contain ≥10 ng/mL 6-AM.

Data resulting from this study indicate comparable effectiveness in using either 2000 ng/mL total morphine or 100 ng/mL free morphine as the criterion for selecting specimens to further test for the presence of 6-AM at the 10 or 5 ng/mL level. The free morphine option is less costly, avoids uncertainty associated with the hydrolysis process, and may produce more nearly accurate results. This study provides an addition to the free morphine-related database and adds further confidence to the use of free morphine data, not previously available.

References

1. B.D. Paul, E.T. Shimomura, and M.L. Smith. A practical approach to determine cutoff concentrations for opiate testing with simultaneous detection of codeine, morphine, and 6-acetylmorphine in urine. *Clin. Chem.* **45**: 510–519 (1999).

Keywords: Heroin, free-Morphine, 6-mono-acetyl Morphine

RAMAN IDENTIFICATION OF ILLICIT STREET DRUG COMPONENTS USING A HAND HELD MINIATURIZED RAMAN SPECTROMETER

Pate, G. Carron, K.***, Dixon**, M., and Bowen, J.* University of Central Oklahoma*, Oklahoma State Bureau of Investigation**, Delta Nu, LLC, Laramie, WY****

Chemical compounds, are often identified by the “fingerprint” characteristics of Raman spectra. This method is beginning to be utilized in Forensic Drug Analysis as a method for drug identification both in the laboratory, but as a tool for trace evidence identification at a crime scene. This study will demonstrate the use of a unique hand held Raman spectrometer for the identification of solid phase illicit drug mixtures and explosives. The instrument was shown capable of analyzing and identifying the components of the Raman spectra of a multicomponent mixture of drugs and cutting compounds.

Lamotrigine: A Forensic Toxicology Overview

*C.L. Huber and T.P. Rohrig Ph.D.
Sedgwick County Forensic Science Center
Wichita, Kansas*

Lamotrigine is an antiepileptic and bipolar disorder drug that is frequently encountered in postmortem toxicology casework. It is commonly prescribed with other medications. Lamotrigine is extensively metabolized and its clearance is affected by concurrent administration of other antiepileptic medications. The analysis of lamotrigine is accomplished by solid phase extraction (SPE) and detection by gas chromatography coupled to nitrogen-phosphorus or mass spectrometer detectors. The SPE method exhibits good linearity (10-2000 ng/mL) with no interference from commonly encountered drugs. Postmortem heart blood “therapeutic” concentrations appear to lie in the 2-15 mg/L range. Limited data suggests that lamotrigine does not undergo postmortem redistribution.

My thanks to the members of the board for their show of confidence in my appointment as the new chair of the membership committee. My thanks and kudos to Brenda Snodgrass for having everything so well organized and making the transition easy.

As our field of study grows in popularity I have no doubt that membership with SAT will also grow. I hope everyone takes the opportunity to welcome new members and encourage them to share their experience and ideas.

I'm looking forward to seeing everyone in Dallas. Please contact me if you have any questions about membership.

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Future S.A.T. Meeting Sites

San Antonio - Fall 2005

Houston - Spring 2006

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SOUTHWESTERN ASSOCIATION OF TOXICOLOGISTS
2005 Spring Meeting
April 28-30 , 2005
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