Gordon Nelson, NRCC-TC, C (ASCP), SAMHSA Inspector, Director 20 years exp. SAMHSA forensic toxicology laboratories <u>stormienorth@msn.com</u>

BASICS OF DRUG TESTING

Samuel (Aaron) Poff, JD MS Chemistry, 10 years exp. drug testing lab

Forensic Analysis Report-CONTROLLED SUBSTANCE ANALYSIS

Item 1 (Agency Item JP-1). Methamphetamine was identified in the plastic bag. The total weight of the white crystalline solid was 27.975 grams +/- 0.006 grams.

The sample was determined to be 100.00 percent +/- 8.32 percent pure methamphetamine. Based on the weight, purity, and measurement uncertainty, the sample contains 27.98 grams +/- 2.33 grams of actual methamphetamine.

Item 2 (Agency Item JP-2). Methamphetamine was identified in the plastic bag. The total weight of the white crystalline solid was 28.148 grams +/- 0.006 grams.

The sample was determined to be 100.00 percent +/- 8.32 percent pure methamphetamine. Based on the weight, purity, and measurement uncertainty, the sample contains 28.15 grams +/- 2.35 grams of actual methamphetamine.

All measurement uncertainties calculated at a coverage probability of 95.45%.

Test Run: Methamphetamine by GC/MS

Amphetamine Result: Negative

Methamphetamine Result: Positive

Methamphetamine is a stimulant and is classified as a schedule II drug, which means it has a high potential for abuse but it also has a medicinal use (in weight control, narcolepsy, and attention deficit disorder). Methamphetamine can be detected in the blood and urine for 1-3 days. The detection limit is 0.05 micrograms per milliliter (mcg/ml) in blood and 0.10 mcg/ml in urine. Toxic effects have been reported at 0.2 mcg/ml and levels starting from 2 mcg/ml may be lethal.

I certify under criminal penalty of the State of Utah

that the foregoing is true and correct.

Analyzed by: Othman Jaber

<u>DISCOVERY</u>: YOU <u>MUST</u> INVESTIGATE.

I call the lab in almost every case, even though I already know 90% of the answers before I call.

77-17-13(6) requires the state's experts "to cooperatively consult with the opposing party upon reasonable notice."



PRETRIAL INVESTIGATION:

Drug buy in a trailer park... Well-known drug den. The officers couldn't drive inside for fear of being seen.



INVESTIGATION:

- The defendant was not at the trailer park.
- Officers <u>did not</u> search the snitch after he left the park the same park that is a known drug den!
- I could hear the snitch's truck door open on the audio, and muffled voices while some sort of conversation took place. I argued this was when the snitch got the drugs.
- An officer searched the snitch's vehicle at police station, but <u>not</u> after he left the trailer park.
- The officers have used this snitch before. He's present when they search the truck. He knows exactly where they're going to search.
- The defendant never actually used the words "Meth" or anything similar during the buy.

***INVESTIGATION:** GETTING THE DRUG TEST

Documents to Send:

1) GRAMA Request (Discovery requests rarely get what you need);

2) Release Signed by Defendant (toxicology only).

*DISCOVERY / GRAMA: THE DOCUMENTS TO ASK FOR:

Screen test results (e.g., EMIT, ELISA, etc.)

GCMS or LCMS chromatography results for your client's sample

GCMS or LCMS chromatography results for the calibrator samples (if a previous day calibration was used, send both calibrators from both days)

GCMS or LCMS chromatography results for the blank and positive control samples.

GCMS or LCMS chromatography results for the internal standards in each sample listed above.

Calibration curve with r^2 value.

Associated internal and external chain of custody documents; photocopies of specimen bottle, bottle seal and bottle specimen ID (toxicology test).

Résumé or curricula vitae of the scientist who certified the test results.

The SOP for the drug(s) tested for.

GREAT PARAGRAPH FROM THE SOP

"With the exception of alcohol, drug levels in blood provide limited information in assessing the degree of impairment in DUI cases. There is insufficient scientific data relating the blood levels of many drugs to the degree of impairment. In accordance with DRE training, toxicologist testimony is based on the 3 legged-stool approach: observations of poor driving, poor field sobriety test performance, and the presence of a drug or metabolite consistent with the subject's symptomology. <u>An opinion of</u> <u>driving impairment based solely on a quantitative level of a drug or</u> <u>drugs is scientifically unfounded and possibly unethical</u>. "¹

USEFUL CONTACT INFO:

Toxicology Tests (Blood, urine, etc):

Tiffany Berardi

Utah Public Health Department

P.O. Box 144300

Salt Lake City, UT 84114-4300

(801) 965-2400

tberardi@utah.gov

"Pure" drug tests (white crystal substance, etc):

Utah Bureau of Forensic Services

4501 S. Constitution Blvd.

Salt Lake City, UT 84129

MANAGING EXPECTATIONS OF YOUR EXPERT

- Be aware of what your expert can and can't do:
- Usually won't be able to say whether the way your client was acting is consistent with his/her drug level.
- The correlation between the level of drug in a single drug test and onset of psychiatric disorders is also not well-characterized in the literature (i.e. peer-reviewed case studies).
- Won't be able to say whether the defendant was impaired based on the drug level.
- BUT THE SAME IS TRUE FOR THE STATE'S EXPERTS. THEY ALSO SHOULDN'T MAKE SUCH CLAIMS.



***BEST CASES FOR EXPERTS**

- 1. Marijuana Cases (Possession): the State lab has too many marijuana cases, and too little funding, so they've stopped doing the tests that are considered the "Gold Standard."
- 2. WHENEVER THE LAB REPORTS PURITY (Possession): the State crime lab continuously reports impossible results (100% pure or higher).
- 3. When the lab weighs the sample and says the result is measured at 95.45 percent confidence interval
- 4. Methamphetamine: probably the most problematic drug with regards to the testing.
- 5. SAMHSA Drug level: the lab will go as low as they possibly can, but this may not be suggested based on research.
- 6. Prescription medications: many defendants will end up having many drugs present in their drug tests, and often prosecutors decide to prosecute the defendant because the defendant is positive for a drug that was not prescribed. In most cases, the other drugs were simply metabolites of the prescribed drug. A simple letter to the prosecutor was usually enough to have the charges dropped in those cases.

95.45 PERCENT CONFIDENCE INTERVAL

3. Requires multiple measurements to calculate the average and standard deviation.

95.45% confidence interval is average +/- 2 SDs.

IMPOSSIBLE WITH ONLY ONE MEASUREMENT



***5. METABOLITES - OPIATES**



PREPARE YOUR EXPERT FOR THESE TYPES OF CROSSES:

Location:	Cross of D's Expert	Notes:
	You'd agree with me that rational people often have opposing viewpoints on the same issue?	
	And two different rational people often form <i>opinions</i> about the same topic?	
	And if an expert were to look at these drug tests, it is possible that he or she could say the drug test was done correctly?	
	And if they disagreed with you as to whether the test was correct, that would be their opinion	
	And if you disagreed with that statement, that would be your opinion, wouldn't it?	

I tried this cross of the state's expert. Can anyone guess what the sustained objection was?

HOW TO CHOOSE AN EXPERT

Your expert's name should be Gordon Nelson 🕲

An expert should ask to see the data before giving an opinion¹ (with one exception).

They should have experience in an actual drug-testing lab, not just in chemistry.

An expert in drug testing should know the answer to this question: What is Deuterium?

Answer: Heavy hydrogen (or hydrogen with one proton, one neutron and one electron), **NOT** heavy water.

¹How to tell if your expert is a hired gun, available at https://www.theexpertinstitute.com/ways-to-tell-if-an-expert-is-a-hired-gun/?utm_source=email&utm_medium=email&utm_content=blog-ways-to-tell-if-expert-is-hired-gun=6.7.18-mini-2

***SOURCES OF CONTAMINATION:**

Laboratory Practices in Sample Handling (Toxicology and Pure Substance) Extraction (Toxicology Tests Only) Instrument Carryover (Toxicology and Pure Substance)

Instrument Wash Solution

(Toxicology and Pure Substance)



DELIBERATE FALSIFICATION

Annie Dookhan: Falsified 10,000+ drug tests Testified in 150+ cases



How Did She Do It??

Prosecutors alleged that whenever a second test (i.e., the confirmation test) failed to confirm the initial results, she would tamper with the vials to make them consistent with the inaccurate results...



Switching samples during aliquoting During Extraction Switching vials on GCMS Unfortunately, it would be nearly impossible to catch someone who was deliberately mixing up the vials, if it's a <u>pure</u> <u>substance test</u>, because most of those tests only test one substance at a time... (Luckily, the lab keeps reporting out purity percentages that are over 100%)

For a <u>toxicology test</u>, however, if the test looks for multiple drugs and metabolites, it would be obvious to an expert if one of the lab's own samples (calibrators and positive control) were swapped for the Defendant's sample, because the quantity for most of the drugs would be very similar to the control / calibrator sample.



A FUNDAMENTAL PRINCIPLE IS THAT ONLY <u>ONE</u> DRUG / CHEMICAL SHOULD TRIGGER POSITIVE RESULTS ON EVERY TEST.

THE TEST IS, AT BEST, INCONCLUSIVE IF MORE THAN ONE CHEMICAL WILL TRIGGER A POSITIVE RESULT.

***TESTS:**

Toxicology: <u>requires</u> two tests, and each test must use different testing methodology

Screen Test

Confirmation Test

Pure Substance: It's common practice that the lab conducts at least two tests

Screen / Roadside Test

Confirmation test

***SCREEN TESTS**

- EMIT / ELISA:
- Point of Care Tests (e.g. Dip Stick / Self-Contained Cup)
- LC-TOF:
- LC-MS/MS:
- RapidFire High-throughput MS:
- MALDI-TOF:

ROADSIDE TEST

- Methaphetamine:
- Cross Example:
- When one or more chemicals will trigger a positive result, the test is inconclusive?
- And the roadside meth test will turn blue if it's positive?
- But there are many other chemicals other than meth that will a make it turn blue?
- (IF NO: but the packaging specifically says MDMA, Ecstasy, XTC, and MDM will also produce a positive blue color)



WORDS OF CAUTION

- **FOUNDATION**: Make sure to have the state's expert / officer lay the foundation for exhibits your expert will be referring to (drug test results, SOP manual, etc).
- Contact prosecutor to stipulate to foundation if possible.
- Contact State lab tech and go over drug test with them to make sure they can lay foundation (Utah Code 77-17-13(6) requires that the state's experts be made available to cooperatively consult with opposing party).

NAR LEC Methamphetamine Detection Kit METH-1

INFORMATION & OPERATING INSTRUCTIONS

GENERAL INFORMATION

METHAMPHETAMINE is also known as Meth, Ice, Crank, Crystal and Speed. It is a manufactured drug, chemically related to a central nervous system stimulant, amphetamine. When a methyl group is inserted into a molecule of amphetamine, methamphetamine is the result. American drug laws classify methamphetamine as a stimulant.

CONDUCTING THE TEST

The NARTEC METHAMPHETAMINE TEST is based upon the development of a blue color when a chemical reagent is added to the drug, methamphetamine.

Before conducting the test, remove the printed cardboard cap from the clear tube.

1. TOUCH THE POWDER

Press or rub the fiber tip to the suspect powder. Powder should adhere to the tip. It is not necessary that the fiber tip be heavily coated with powder. In most instances, a few particles on the tip are sufficient. If the sample is a tablet, scrape the tablet to make a powder.

2. CRUSH THE AMPULE

The clear protective plastic tube contains a glass ampule of liquid. With the fiber tip pointed upward, squeeze the plastic tube to crush the ampule. Hold the tip downward and gently squeeze the tube to force the liquid into the fiber tip.

3. OBSERVE THE COLOR

An immediate deep blue color (developing within 1 - 4 seconds) is a positive test for the drug, methamphetamine. Another drug, 3,4 methylenedioxymethylamphetamine, which is also known as MDMA, Ecstasy, Adam, XTC and MDM, will produce the blue color. Amphetamine, MDA, MMDA and other drugs of abuse will not produce the blue color. Disregard other colors (maroon, gray, brown or black) that may appear more slowly. A reddish-brown color is a normal color for the reagent.

The methamphetamine test can be used along with a test for amphetamines (the Marquis test) for additional drug identifications. The amphetamine (Marquis test) is available from NARTEC, Inc, in a drop dispensing form.

Drug	Amphetamine (Marquis) Reagent	(Sodium Nitro- prusside) Reagent	
Amph.	orange-brown	negative	
\$ Meth.	orange-brown	positive (blue)	
MDA	inky black	negative	
MDMA	inky black	positive (blue)	
MMDA	inky black	negative	

COLOR REACTIONS

THE OFFICER AND THE ROADSIDE TEST

• 2 Trials on the same day

- All officers claimed they had never seen the document, despite the fact that it's inside every bag of vials they use for the field test, and I had it copied right at the police station.
- No one in either trial could lay foundation for the exhibit, so I couldn't crossexamine the officer on it.



LAYTON POLICE SUSPECTED OFFICER'S DRINK WAS SPIKED WITH METHAMPHETAMINE

An officer in Layton went through a drivethrough and purchased a sandwich and a drink from Subway.

The officer felt sick, so he tested the drink, which tested positive for Meth and THC (Unknown what test was used; likely a roadside test kit)

Tanis Ukena, the Subway worker who filled order, was arrested.

The state lab tested the drink and found no evidence of any controlled substance.





• The application of MS in combination with chromatography [GC or liquid chromatography (LC)] has been well recognized as the "gold standard" for both quantitative confirmation and semi-quantitative toxicology screening

***SAMHSA DETECTION LEVELS**

Screen Test

Initial Test Analyte	Initial Test Cutoff
Marijuana metabolites (THCA) ¹	50 ng/mL
Cocaine metabolite (Benzoylecgonine)	150 ng/mL
Codeine/Morphine	2000 ng/mL
Hydrocodone/Hydromorphone	300 ng/mL
Oxycodone/Oxymorphone	100 ng/mL
6-Acetylmorphine (6-AM)	10 ng/mL
Phencyclidine	25 ng/mL
Amphetamine/Methamphetamine	500 ng/mL
MDMA ² /MDA ³	500 ng/mL

 $^{1}\Delta$ -9-tetrahydrocannabinol-9-carboxylic acid (THCA)

²Methylenedioxymethamphetamine (MDMA)

³Methylenedioxyamphetamine (MDA)

***SAMHSA DETECTION LEVELS**

Confirmation Test

¹To be reported positive for methamphetamine, the specimen must also have an amphetamine concentration equal to or greater than 100 ng/mL.

***DRUG LEVELS-THC**

- Legalization of marijuana has resulted in cannabis strains with increased potency
- Increased cannabis potency has renewed concerns that secondhand exposure to cannabis smoke can produce positive drug tests
- Study conducted of smoke exposure on drug-free participants
- 6 experienced cannabis users smoked cannabis cigarettes in a sealed chamber with alternated seating with 6 non-smokers
- No presumptive positives by 4 immunoassays occurred for non-smokers at 100 and 75 ng/mL cutoffs; a single positive occurred at 50 ng/mL; and multiple positives occurred at 20 ng/mL
- Maximum THCCOOH concentrations by GC-MS for non-smokers ranged from 1.3 to 57.5 ng/mL.
- THCCOOH concentrations generally increased with THC potency, but room ventilation substantially reduced exposure levels.
- Results demonstrate
 - Extreme cannabis smoke exposure can produce positive urine tests at commonly utilized cutoff concentrations Positive tests are likely to be rare

 - Limited to hours immediately post-exposure Occur only under environmental circumstances where exposure is obvious

Cone E., et al., Non-Smoker Exposure to Secondhand Cannabis Smoke. I. Urine Screening and Confirmation Results, Journal of Analytical Toxicology 2014;1-12.

*COMMON MISCONCEPTIONS ABOUT DRUG LEVELS

- Drug levels cannot be used to determine
 - When the last dose was
 - How many pills were taken
 - Whether the person medication as prescribed

Confirmation test (Toxicology) Acceptance Criteria = what to use for your cross.

Pure substance SOPs aren't as easy to go through to get a "checklist."

ACCEPTANCE CRITERIA AND CALCULATIONS

 Internal Standard: Internal Standard recovery must be within 50 to 200% relative to the calibrators for all controls and samples within the batch of analysis.

Chromatographic peak: Peak should be symmetrically shaped with no indication of coelution. The baseline must be flat (stable and returns to the same level). In the event, where manual integration is necessary due to improper integration performed by the data system, i.e. retention time shift, tailing, baseline noise, asymmetry etc., it must be justified and the reason for manual integration must be noted on the data analysis paperwork for review purposes.

- Calibrators: A calibration curve is derived by comparison between the ratios of the calibrator peak areas to their respective internal standard peak areas. The ratio of sample peak area to internal standard peak area is compared to the calibration curve to provide a quantitation of compounds in the sample.
 - a. The calibrator coefficient (r^2) must be ≥ 0.99 .
 - b. A minimum of 3 calibrators is needed to construct the calibration curve.
 - c. Calibration points may be removed from the curve in order to improve the linearity of the curve. If the removal of a point from the curve changes the high or low reporting limits, the change must be documented and the range must be adjusted accordingly.
 - d. Calibrators and Check standards must fall within ±20% of the target value.
- 3. Controls:
 - a. The Positive Control result must fall within ±20% of the target value.
 - b. Negative Control result (Internal Standard Blank) must be less than the lower reporting limit for each analyte.
- 4. Samples:
 - a. The retention time for the analyte(s) of interest must be within ±0.2 minutes of the retention time for the respective analytes in the calibrators.
 - b. The analytical result (or its mass spectra) must have satisfactory quality (Q-Values ≥ 80). Exceptions to the quality criteria of 80 or greater are permitted in certain cases as long as the exception is documented and approved by the reviewer.
 - c. The ion ratios must be within 20% of the calibrator ion ratios. Some ion ratios are

CHECKLIST

- 1. <u>Retention time</u>
- 2. <u>Ion ratios (for drug tests only; not used in</u> <u>alcohol tests)</u>
- 3. Chromatography / Peak Shape
- 4. Integration lines
- 5. Internal standard
- 6. Calibrators
- 7. Calibration Curve
- 8. Positive Control
- 9. Blank Control



The standard for testing for THC in the drug testing community:

Toxicology – EMIT screen followed by GC-MS or LC-MS/MS confirmation

Plant – confirmation by GC-MS, LC-MS, LC-MS, LC-TOF

THC: HOW THE UTAH LAB IS DOING IT (POSSESSION)

The State Performs 3 Tests (I know, it sounds intimidating):

- 1. Macroscopic test (i.e., it looked like marijuana)
- 2. Microscopic test (i.e., what it looks like under the microscope)
- 3. Duquenois-Levine Chemical test (i.e., a color change test)

This battery of tests is based on a 1972 study by J. I. Thornton and G. R. Nakamura.¹

MACROSCOPIC TEST

1. The Macroscopic Test: It Looks Like Marijuana, "Based on Training and Experience," So It Must Be Marijuana, Right?



In 1972, over 30,000 plants had been discovered that look like marijuana. In 2002, over 190,000 plants had been discovered that look like marijuana.

MICROSCOPIC TEST

2. Microscopic Test: If It Looks Like Marijuana Under a Microscope, It Must

Be Marijuana, Right?



Look for: A) simple hairs, B) cystolithic hairs (hairs encrusted w/ calcium carbonate deposits)

In the 1972 study, the researchers looked at 600 of the \sim 30,000 plants, and <u>82</u> of them had hairs similar to marijuana = 13.66%

Unknown how many of the ~190,000 plants would have the hairs. If 13.66% have the hairs, then ~26,000.

DUQUENOIS-LEVINE TEST

3. Duquenois-Levine Test: turns purple in the presence of marijuana



In the 1972 study, of the 82 plants with simple hairs and cystolithic hairs, only 1 turned purple!

SO, IF ALL THREE TESTS ARE POSITIVE, THAT MEANS IT MUST BE MARIJUANA, RIGHT??

Sorry, but until all 190,000 plants have been tested, we'll never know which might turn purple.

DUQUENOIS-LEVINE TEST

NOT SO FAST: ALMOST ANY CHEMICAL WITH A "PHENOL" FUNCTIONAL GROUP WILL TURN PURPLE



Phenol groups: one of the most common chemicals in nature (e.g. coffee).

Sample cross:

- 1. In your lab, you take great pains to make sure nothing is contaminated?
- 2. But there's no way for you to be sure there was no contamination before it came into your lab?
- 3. And the chemical in coffee will also cause a purple result?
- 4. If someone spilled coffee on this plant before it came into your lab, that would cause it to turn purple?

THC TEST (POSSESSION) CONT.

NONE OF THESE TESTS ARE CONSIDERED SUFFICIENT IN THE SCIENTIFIC COMMUNITY, WHETHER BY THEMSELVES OR TAKEN TOGETHER. ONLY GCMS OR LC-MS/MS ARE CONSIDERED THE "GOLD STANDARDS."

*METH: THE MOST PROBLEMATIC DRUG TEST

There are 2 types of meth: L-Meth ("Over-the-counter Meth"),and D-Meth ("Street Drug Meth")

The extremely high values for urine methamphetamine increase likelihood for carryover on the instrumentation

The GCMS test run by the state lab does <u>NOT</u> distinguish between the two types of meth, but it could by using a chiral derivatizer.²

There are over 14 different drugs that are <u>metabolized</u> into Meth (unknown whether D or L)³.

^{2.} BUDDAH D. PAUL, ET. AL, ENANTIOMERIC SEPARATION AND QUANTITATION OF (±)-AMPHETAMINE, (±)-METHAMPMHETAMINE, (+-)-MDA, (±) MDMA, AND (±)MDEA IN URINE SPECIMENS BY GC-EI-MS AFTER DERIVATIZATION WITH (R)-(-)-OR (S)-(+)-A-METHOXY-A -(TRIFLUOROMETHYL)PHENYLACETYL CHLORIDE (MTPA)JOURNAL OF ANALYTICAL TOXICOLOGY, VOL. 28, SEPT. 2004
3. JOHN T. CODY AND SANDRA VALTIER, DETECTION OF AMPHETAMINE AND METHAMPHETAMINE FOLLOWING ADMINISTRATION OF BENZPHETAMINE, JOURNAL OF ANALYTICAL TOXICOLOGY, VOL. 22, AUG. 1998





Pseudoephedrine (PSE) can give a false positive result for Meth if done by GC-MS because the machine turns PSE into Meth if the temperature of the injection port is higher than 220° C⁴. Dependent on derivatizing agents, as well.

Possession cases: The State lab's injection port is 260° C for their meth test. **Toxicology Cases:** they usually do the test by LC-MS/MS, which doesn't have the same problem. If they do a GC-MS test, and your client's Meth test showed positive for Meth and Amphetamine, then he's probably out of luck unless he has a prescription for some type of amphetamine (e.g., Adderall) because the machine turns PSE into Meth, but it doesn't turn Meth into Amphetamine.

4. Cecil L. Hornbeck, et. al, *Detection of a GC/MS Artifact Peak as Methamphetamine*, Journal of Analytical Toxicology, Vol. 17, Sept. 1993

WHAT MIGHT HAVE WORKED

- State chemist testified that they checked the **ion ratios**, and that's how they know it wasn't sudafed.
- Outside expert could testify that they did not provide any evidence that they had actually checked the ion ratios because the information below was <u>NOT</u> in the lab's report (#2 on the checklist).

(4) Methamphetamine							
3.247min	(-0.001)	50.94NG/	ML				
response	78925						
Ion	Exp%	Act%					
154,00	100	100					
118.00	28.80	31.69					
110.00	24.70	0.00#					
0.00	0.00	0.00					

- Looking for one little # in a drug test
 ~20 pages long
- You probably need to hire an expert to find this major error. It's definite proof that the substance was pseudoephedrine, not methamphetamine.

*METH COLOR TEST (THE FIRST TEST THE LAB RUNS IS IDENTICAL TO THE ROADSIDE TEST)

Pure Substance: Although the machine (GCMS) used to test for meth can change PSE into meth, the State lab uses a second test (called the "color" test) which will not give a false positive for PSE. **HOWEVER**, the color test can give a false positive for almost any secondary amine (e.g., Methamphetamine, MDMA, Ecstasy, XTC, MDM and PSE are **all** secondary amines; Amphetamine is a primary amine). There are literally thousands of known secondary amines, some of them very common (for example, your spit contains an enzyme called <u>salivary amylase</u>, which contains 23 proline amino acids, all of which are secondary amines)





Primary Amine

Secondary Amine



Proline, a Secondary Amine OFFICER BLOWS ON CAPSULE TO GET IT TO TURN BLUE

Watch those videos: sometimes the officer will blow on the roadside test capsule if it doesn't change blue immediately.

Blowing on the capsule = contamination.

What if the officer recently had the same soda that caused the false positive in the Layton Subway case?

METH ISOMERS

Be aware there is some bad case law about the two kinds of Meth (D and L isomers).

State v. Madsen, 28 Utah 2d 108 (1972).

State's expert testified "that the 'd' and 'l' configurations have **identical** chemical properties except for optical rotation, and that both are stimulants."

We know now that this statement is false; the isomers do not have identical properties. D-Meth is 1,000 times more potent than L-Meth, which is why L-Meth is available over-the-counter. They also have different effects on the body. But L-Meth is still technically a **Schedule II** controlled substance in Utah

58-37-4(2)(b)(iii)(B): "Methamphetamine, its salts, **isomers**, and salts of its isomers."

You can literally go to a pharmacy after this CLE and buy L-Meth without a prescription.

THE LAB TEST DOES NOT DISTINGUISH BETWEEN D-METH AND L-METH. "We don't care."

21 USC 811(g)(1): "The attorney general shall exclude any non-narcotic drug which contains a controlled substance... which may, under the Federal Food, Drug, and Cosmetic Act, be lawfully sold over the counter without a prescription.

METH ISOMERS

LOSING STRATEGY (JUDGE TAYLOR): ARGUING THAT THE TEST DONE BY THE STATE LAB DOESN'T DISTINGUISH BETWEEN D- AND L-METH.

Judge Taylor: "the lab doesn't pay attention to the difference because the legislature apparently doesn't know the difference. Methamphetamine and all of its isomers is prohibited by the statute."

METHAMPHETAMINE GCMS



METH: FAILED TRIAL STRATEGY

- Cross-examining the state's chemist about the drug test results without hiring an outside expert.
- Judge Taylor: "it's... frustrating when a[] [state] expert witness is the only expert witness on the scene. She comes in and she testifies and she's... an acceptable expert. She qualifies as an expert. She has training. She has the experience. She expresses her conclusion. And the only challenge to her conclusion is <u>knowledgeable</u> cross-examination... the only way you're going to win with that [cross-examination] is you convince me that she's completely uncredible, and you didn't do that in this case."
- [FYI I challenged just about every possible aspect of the drug test on cross that I possibly could]

METH: WHAT WORKED

- <u>Cross</u>:
- A useable amount of methampehtamine is 1/10th of a gram?
- The total amount of meth in the baggie was too small for you to measure?
- But you can measure all the way down to $1/100^{\text{th}}$ of a gram?
- And the amount in the baggie was less than that?
- That's less than 1/10th of a useable amount?
- + Video When They Found the Meth, Defendant said "It's Empty!"
- = <u>Not guilty</u>.

METH: WHAT WORKED

- Challenging the officer's training by objecting to the foundation of their "training and experience" and cross-examination.
- Judge Taylor "It's a little troublesome for officers to come in and lay foundation by just describing the general milieu of law enforcement. 'I've been told'... 'it's my experience,' without telling me the experiences, without telling me what they have seen and what they have experienced and why they've come to the conclusions they wish to state... They're much less helpful when... they are unsupported general recitations of what someone said... it's very frustrating that officers come in and simply want me to... accept the generally acknowledged common wisdom with regard to this, that or the other."

ACCURACY: IT'S THE LAW

Williams v. Schwendiman 740 P.2D 1354 "proof of proper maintenance of a breathalyzer machine and competence of the person administering the test [are] prerequisites for admission of test results."

State v. Kinne 2001 Utah App. Lexis 306 (unpublished opinion): State challenged trial court's ruling suppressing breath test results that proper foundation for admission of a breath test result requires evidence of the **accuracy and reliability** of the testing instrumentality. "The State provided no such proof. Thus, the district court correctly excluded 'all of that evidence."

THE REMAIING EVIDENCE DID NOT RISE TO THE LEVEL OF PROBABLE CAUSE (I.E., GREAT FOR PRELIMS, EVIDENTIARY HEARINGS ON OSC).

*ACCURACY

Accuracy of test:

- Controls are used to check the accuracy and validity of the calibration
- Most regulatory agencies require that controls are derived from a different source than the calibrators
- External check on laboratory accuracy and quality of testing process proficiency testing
 - All toxicology regulatory agencies require that laboratories participate in external proficiency testing programs, or conduct other processes to monitory accuracy and quality of the overall testing process
- Competency of testing personnel

All regulatory agencies have requirements for periodic monitoring of the competency of testing personnel

ACCURACY: HEARSAY

SLC v. George 2008 UT App 257: challenge to admission of calibration certificates without testimony of individual who prepared them. Held: they are non-testimonial, and therefore admissible, but the court held that they were <u>not</u> self-authenticating.

Melendez-Diaz v. Massachusetts 557 US 305 (2008): drug test results admitted in state court over objection of defendant, without testimony from tech who did the test. Held: the 6th amendment right to be confronted with witnesses against him was violated. The documents "fall within the 'core class of testimonial statements" described in *Crawford*.

Dissent: there are up to four people involved: 1) the person who prepares the sample, 2) the person who interprets the graph, 3) the person who calibrated the machine, 4) the supervisor certifies that his subordinates followed the established procedures. "It is possible to read the Court's opinion... to say that all four must testify."

I AGREE! EVERYONE EXCEPT FOR THE SUPERVISOR SHOULD BE SUBJECT TO CROSS. If this interpretation is correct, this overrules SLC v. George.



If the trial court won't suppress the evidence even if the specific lab tech doesn't show up to court, cross the one who does show up:

- 1. you did not do (extraction, put vials on instrument in correct order, etc).
- 2. Because you didn't do ___, you don't have personal knowledge that the correct procedures were followed for ____.
- 3. There have been news stories of lab personnel falsifying drug test results.
- 4. Some lab personnel are willing to falsify results.
- 5. You're not willing to falsify lab results, but you don't actually know for sure whether or not the other lab tech did something to falsify these results, do you?