

The Lab Report

Volume 3, Issue 3

October 2013

Table of Contents

Prescription Drug Identification and Submission	2-3
NSP Large Quantity Drug Submission Policy (83-2)	4-5
NFSTC Crime Scene Investigation Guide for Law Enforcement (FREE)	6
Rapid DNA Technology	7-8
Recovery of Latent Prints on Firearms	9-11
Hints on Evidence!	12
Spotlight on Forensics	12
Crime Lab Contact Information	13

“Fall” into Forensics...

Topics highlighted in the October 2013 issue of The Lab Report include: Prescription Drug Identification and Submission, the NSP Large Quantity Drug Submission Policy, information and a link to the **FREE** NFSTC Crime Scene Investigation Guide for Law Enforcement, information pertaining to Rapid DNA Technology, and factors affecting the recovery of latent prints on firearms. Also included will be updated data for section turnaround times/backlogs, hints on evidence submission (evidence submittal forms), and the Spotlight on Forensics featuring one of the NSP Crime Laboratory analysts!

For convenience, any links that are imbedded in The Lab Report documents can be accessed simply by clicking on the link!

If you have any questions/concerns regarding the topics related to this issue of The Lab Report, please do not hesitate to contact us (laboratory staff contact information - pg. 13).

Enjoy!

Amy Weber (Firearm/Toolmark Section Analyst - editor, The Lab Report)

The Backlog Corner

Biology Unit: 152 assignments (approx. 5 month turnaround time)

Physical Sciences Unit:

Firearm/Toolmark cases: 38 assignments (approx. 7 month turnaround time)

NIBIN: 94 assignments (approx. 6 month turnaround time)

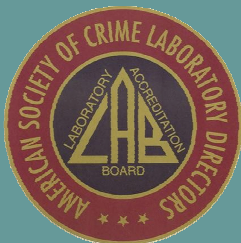
Latent Fingerprints Section: 45 assignments (approx. 3-4 week turnaround time)

Chemistry Unit:

Controlled Substances: 802 assignments (approx. 4 month turnaround time)

Toxicology: 53 assignments (approx. 2 month turnaround time)

Trace: 9 assignments (approx. 1 month turnaround time)



ASCLD/LAB accredited
since 2004.



Chemistry Unit

(Controlled Substances)

Celeste Laird (Mgr)

Vicky Cowan

Mandy Dahlberg

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Meggan Macomber



Generic Adderall

Prescription Drug Identification and Submission Tips

National trends have shown a marked increase in the abuse and illegal sale of prescription drugs over the past several years. Without access to the proper resources in the field, it is often difficult for officers on a scene to identify whether or not a capsule/tablet without descriptive packaging is a legal drug to possess (e.g. over-the-counter medication) or if it is considered an illegal controlled substance and should be sent to the crime lab for testing.

In an effort to continue to provide the best, most timely results, the NSP Crime Laboratory Controlled Substances section has provided the following helpful identification and submission tips for officers to utilize while out in the field.

Prescription Drug Identification in the Field

Check the tablet/capsule markings in an attempt to identify the drug **prior to submission**. After identification is made, only submit those tablets/capsules that are defined as controlled substances (not over-the-counter or drugs in which the suspect has a valid prescription).

- Over-the-counter tablets/capsules are NOT controlled and can be obtained without a prescription.
- Many prescription medications (e.g. Antibiotics) are not controlled - they require a prescription, but are not listed in Nebraska Statutes under 28-105 schedule of controlled substances.

Suggested Prescription Drug Identification Resources

The following resources are available to officers to utilize in the field to assist in the identification of unknown prescription drugs:

- ⇒ Local Poison Control hotlines
- ⇒ The Drug Identification Bible (<http://www.drugidbible.com/>)



Prescription Drug Identification and Submission Tips

- **Drugs.com** is a comprehensive and up-to-date source of drug information online. This resource provides **FREE**, peer-reviewed, accurate and independent data on more than 24,000 prescription drugs, over-the-counter medicines, and natural products. Located on the website is a prescription drug identification program called “Pill Identifier”, in which you can search the identity of an unknown tablet/capsule by imprint (numerics, alpha characters, or symbols), color, and/or shape.

<http://www.drugs.com/imprints.php>

Also located on the Drugs.com website, are several apps that are available for iPhone and Android devices. These apps range in price from free up to \$39.95 for premium apps. <http://www.drugs.com/apps/>

Additional Prescription Drug Submittal Considerations

- The submitting officer should note on the NSP Crime Laboratory evidence submittal form (750) what the prescription drug marking check indicated as to the possible identity of the submitted substance.
- Prior to submitting tablets/capsules for testing, officers should verify that the holder does not have a valid prescription for the drug. The drugs should **ONLY** be submitted if the holder has **NO** valid prescription.
- **ANY marked tablets/capsules submitted to the lab that are not controlled will NOT be tested in ANY manner. Policies such as this one help us make the most efficient use of our and your time.**

For additional questions/concerns regarding prescription drugs and their submission, please do not hesitate to contact the Controlled Substances Unit.



Vicodin (hydrocodone)

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Generic Hydrocodone



NSP Large Quantity Drug Submission Policy 83-2

The Crime Laboratory is responsible for the receipt and storage, during testing, of evidence submitted by all law enforcement agencies in the State of Nebraska. There is a limited amount of room in which to store these pieces of evidence. Some of the drug cases submitted **can** amount to hundreds of pounds! Along with the storage considerations go the consideration of health and contamination hazards. Substances which are in fine powder form, as is typical with cocaine and heroin, pose both hazards. The chemicals associated with clandestine laboratories pose health and fire hazards. **In order for the Chemistry Unit to provide timely analysis, limitations must be placed on the number and volume of items submitted.**

State Sentencing Guidelines (as defined in 28-416 of the Nebraska Criminal Code)

1. The maximum weight of cocaine or cocaine base is 140 grams.
2. The maximum weight of marijuana is 1 lb.
3. The maximum weight of heroin is 500 grams.
4. The maximum weight of amphetamine or methamphetamine is 1lb.

These weights are necessary to provide the maximum penalty at sentencing. The limits have been set to ensure they meet and actually exceed these weights.

The Crime Laboratory is not a Federal lab, therefore it does not normally refer to Federal sentencing guidelines.

NSP Policy for Controlled Substance Testing

A. For **large marijuana cases, up to 2 lbs.** will be accepted into the laboratory. In the event that one brick weighs more than 2 lbs, one total brick will be accepted.

- If it is necessary to have all other bricks tested, samples from each remaining brick may be submitted. These samples should be identified as samples coming from a larger brick and will be analyzed, but not weighed, as the weight would have no meaning.

B. For **large cocaine or heroin cases, up to 1 kilo (approx 2lbs)** of powder will be accepted into the laboratory. In the event that one bundle weighs more than 1 kilo, we will accept one total bundle.

- If it is necessary to have all other bundles tested, samples from each remaining bundle will be accepted. These samples should be identified as samples coming from a larger bundle and will be analyzed, but not weighed, as the weight would have no meaning.

Chemistry Unit

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NSP Large Quantity Drug Submission Policy 83-2

NSP Policy for Controlled Substance Testing (continued)

- C. For **large methamphetamine cases** it is permissible to submit the entire case.
- D. Cases being prosecuted federally allow much higher quantities for their sentencing guidelines. All Troop areas have been equipped with scales identical to the ones used at the Crime Laboratory. The bundles or bricks should be weighed at the troop areas and the steps above should then be followed.
- E. Large quantities of **hazardous chemicals** will **not** be accepted by the Crime Laboratory. If the submitter is not familiar with the State Patrol's Clandestine Laboratory sampling guidelines, they may either contact one of the trained Clandestine Laboratory Investigators or one of the Crime Lab Chemists for information on proper packaging of the chemical for submission.

For additional information regarding NSP Crime Laboratory Chemistry Unit controlled substance testing/submission guidelines, do not hesitate to contact the Chemistry Unit Manager and/or refer to the following link:

http://www.statepatrol.nebraska.gov/media/11193/controlled_substances.pdf



Chemistry Unit

(Controlled Substances)

Celeste Laird (Mgr)

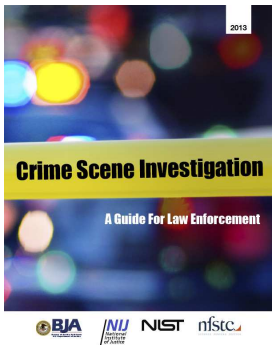
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NFSTC Free Expanded CSI Guide Available

The National Forensic Science Technology Center (NFSTC) is a forensic science center dedicated to the advancement of all forensic science disciplines. The NFSTC works closely with other forensic professional organizations (American Society of Crime Lab Directors (ASCLD), American Board of Criminalists (ABC), Association of Firearm and Tool Mark Examiners (AFTE), and the International Association for Identification (IAI)) to focus on consistency and quality of forensic services provided by crime laboratories throughout the country.

NFSTC recently released the document, **Crime Scene Investigation, A Guide for Law Enforcement**, on September 17, 2013. The guide, developed by crime scene and forensic laboratory experts in the field, is detailed, step-by-step guide that walks crime scene responders through the following:

- **Initial Response/Prioritization of Efforts at the Crime Scene**
- **Preliminary Documentation and Evaluation of the Scene**
- **Processing the Scene (photography, search methods, collection/preservation of evidence - DNA, footwear/tire, latent fingerprints, trace, tool marks, firearms/ammunition, motor vehicles, digital evidence, documents, ignitable fluids, etc.)**
- **Completing and Recording the Crime Scene Investigation**
- **Crime Scene Equipment**

The 180 page document is available **FREE** for download from the NFSTC website in the following formats: PDF, Kindle, all major e-readers, smartphones, and tablet devices. Attached below are links to the main NFSTC website, the Crime Scene Guide, and the PDF version of the guide.

- <http://www.nfstc.org/wp-content/files/Crime-Scene-Investigation.pdf>
- <http://www.nfstc.org/>
- <http://www.nfstc.org/expanded-csi-guide-now-available-%e2%80%93-free/>



Rapid DNA Technology

Lately there have been increases in advertisements for Rapid DNA technology circulating around the nation's law enforcement agencies by several different companies. You may be asking questions such as "What is Rapid DNA?" and "Should I be paying attention?". The purpose of this article is to give law enforcement agencies some basic information regarding Rapid DNA technology and limitations to keep in mind as this type of technology becomes more prominent.

Rapid DNA Technology: What is It?

Rapid DNA is a technology that allows the user to insert a DNA swab directly in the instrument and get a DNA result out in about 90 minutes. WOW, that sounds too good to be true! Are you ready to purchase one yet? **The answer to that question is very complicated.**

Several companies currently have the technology on the market. The technology has been driven in part by the Department of Defense because it is an easy to use, closed system that can be easily transported. This makes it a great tool for DNA testing in the rough conditions of a military battlefield. It will also be a useful tool for booking stations and the collection of DNA from arrestees in those states that collect such samples. **Nebraska is not in a war zone and we don't collect DNA from felony arrests, so, now how does it apply to us?**

Some of the marketing material also suggests that you could perform your own DNA testing, either in the field or in your police station, on your own evidence and compare it to your suspect in the case. Now that sounds great. After all, the lab still has the 4-5 month turn around and you can't afford to pay a private lab for testing on a misdemeanor or burglary charge. **There are several points and limitations to consider with regard to the fine details of utilizing this technology:**

- **A qualified DNA scientist still has to interpret the results, make a conclusion regarding the inclusion or exclusion of the suspect, and then, testify in court to those results!**
- **This technology is so new, that it is not yet been integrated into the CODIS database system. That means that any profile obtained by you through the system cannot go into the database, even if you send it to the lab.** CODIS is regulated by the FBI under federal law. The FBI is currently evaluating the technology and working on a plan to integrate Rapid DNA into CODIS. This is a fairly involved process as the technology must be thoroughly validated, policies and procedures developed to regulate the use of it, and to develop proper quality control measures to ensure the integrity of the data being generated.



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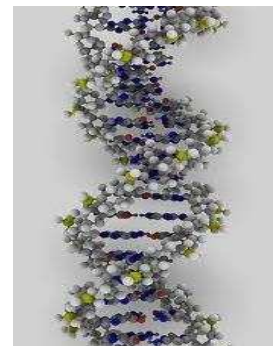
Christel Davis

Hilary Duin (CODIS)

Melissa Kreikemeier

Brandy Porter

Heidi Young





Rapid DNA Technology (continued)

- In addition to our laboratory wide accreditation standards, **DNA labs are required to comply with 398 separate standards for DNA casework and 375 standards for DNA databasing along with regular audits.** This is important because of the power of DNA testing and the reliance on the results by the criminal justice system.
- Additionally, while the technology is developing fast, it is still in its infancy stages. **It appears that the sensitivity is less than what we currently see at the lab and it has not yet been proven useable with mixtures.** Most of you know based on your own submissions that nearly 40-50% of our caseload is now low level touch samples, many of which turn out to be complex mixtures.

Rapid DNA Technology is definitely going to be a player in future DNA testing, but we must very carefully consider how we integrate it within the state. **There must be cooperation between those involved at every level to oversee its use and to ensure the integrity of the results.** By proceeding cautiously in the implementation of Rapid DNA, we can be properly prepared for potential Daubert and other similar challenges in the court system.

If you have any questions or concerns with regard to the technology discussed in this article, please contact the NSP Crime Laboratory DNA Unit Manager, Jason Linder for further information/clarification: Jason.Linder@nebraska.gov or 402-471-8950.

Biology Unit

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Christel Davis

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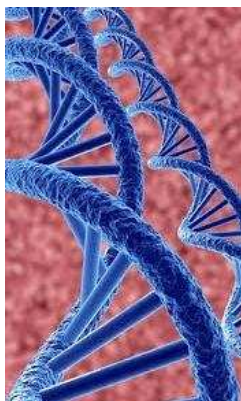
Heidi Young



Examples of two Rapid DNA instruments:

Top: Rapid HIT by Integenx

Bottom: Rapid DNA Analysis Solutions by NetBio



Recovery of Latent Prints on Firearms

The best way of connecting a gun to the person who HANDLED the weapon is by testing it for DNA and fingerprints. The recovery of latent fingerprints on firearms in **most** circumstances is very difficult, and oftentimes very few identifiable latent prints are developed. **In this article we will address the following factors involved in recovery of latent prints on firearms: environmental factors, atmospheric conditions, damage to friction ridge skin, and firearm finishes.**

Environmental Factors

How a firearm is handled between the time a latent print is deposited and the time the firearm is recovered can greatly affect the processing outcome. Removing and placing firearms in holsters, between car seats, inside the waist band of pants, etc. **may** cause the latent prints to rub off. Latent impressions on firearms recovered by the roadways, dusty fields, water, etc., may also be obliterated. Offenders have also been known to wipe off the interior and exterior parts of firearms, thereby eliminating any chance of developing identifiable latent prints.

Atmospheric Conditions

Latent prints are composed of 98.5% to 99.5% water. Air, temperature, and water all have an effect on the survivability of latent prints, and their subsequent development.

Moderate to strong air currents, higher temperatures and low humidity will cause evaporation of the water portion of perspiration, but may have little immediate effect on the remaining salts, amino acids, fats and lipids.

A cold surface and high humidity can eventually create condensation on an object's surface possibly causing the latent deposits to wash away. Rain can wash away non-fatty/oily deposited latent prints. Dew and snow in combination with perspiration will also dilute the latent print residue. This can form a barrier between the surface and the friction ridge skin thereby preventing impressions from being deposited.

Firearm Finishes

Latent prints are particularly difficult to develop on the Parkerized (grainy, non-reflective micro-texture) finish used on many firearms as rust prevention . This type of finish prevents the successful deposition of latent impressions on the firearm surface. **Firearms possessing chrome, smooth nickel, or stainless steel finishes are better for the recovery of latent prints.**



Latent Fingerprint Section

Mariana Ward (Sup)
Steven Burke
Bridget Driver



Parkerized Finish



Recovery of Latent Prints on Firearms (continued)

Damage to Friction Ridge Skin

Friction ridge skin can be damaged permanently or temporarily, depending on the circumstances of the trauma. Permanent damage can occur because of scarring or disease. Temporary damage is usually due to superficial burns, warts, and occupational situations. Perspiration excreted from the fingers also contains 0.5 to 1.5 per cent solid matter. The amount of perspiration transferred from the skin to the object touched is the main factor bearing on the identifiability of latent prints. The damage to the skin will cause the donor to leave very poor or unidentifiable latent fingerprints, which could prevent residue from being left in sufficient quantity to be detected.

Issues Regarding Processing Firearms for Latent Prints

Firearms can be difficult to process due to a variety of reasons to include the condition of the metal and the limited amount of smooth area available for processing. More and more firearms are being manufactured using polymers instead of metal, which have **textured surfaces that are not conducive to the retention of latent prints**. The surface is often dirty, oily, or greasy, and the investigator must touch the same areas of the firearm as the offender in order to unload it safely. **For these reasons, the developed impressions are often superimposed or smudged.**

When it comes to physically processing firearms for the presence of latent prints, performing this in a laboratory setting generally yields better results.

Officers in the field often process (**and over process**) firearms with conventional fingerprint powders. **The conventional powder sticks to the oily surface of the firearm, causing smudging - with the end result being that the impressions are often not useable for comparison purposes.**

Much better results can be obtained in laboratory setting by superglue fuming, applying fluorescent dyes, and examination under the Alternate Light Source (ALS). Developed value latent impressions can then be photographed, rather than lifted, which would also provide better results.

The other option available in the lab is to utilize Reflective Ultra Violet Imaging System (RUVIS) to visualize latent impressions. While RUVIS does not require any other pre-processing to be conducted, the prolonged exposure of the firearm to RUVIS' UV light **will destroy any DNA. This should be kept in mind prior to the submission of the firearm for latent processing.**

Latent Fingerprint

Section

Mariana Ward (Sup)

Steven Burke

Bridget Driver



Superglue fumed firearm

Recovery of Latent Prints on Firearms (continued)

Packaging the Firearm

When firearms are submitted to a crime laboratory for latent print examination, a sturdy box with the firearm tied or strapped down to the bottom of the box should be used. Items not safely secured inside the packaging will shuffle and rub against each other, causing impressions to smudge or rub off.



Proper firearm packaging

Summary

There are a number of factors that affect the ability to recover identifiable latent prints on firearms: the longevity of a latent print due to how it was deposited, atmospheric and environmental conditions at the time of seizure, perspiration variation, the nature of the firearm's surface and finish, how the firearm was handled, and packaging.

Even though developing identifiable impressions can be difficult, the attempt should always be made.

If you have any questions or concerns with regard the recovery of latent prints on firearms, please contact the NSP Crime Laboratory Latent Fingerprint Section Supervisor, Mariana Ward for further information/clarification:

Mariana.Ward@nebraska.gov or 402-471-8950.

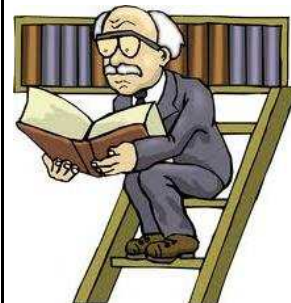
For further reading on the topic of recovery of latent prints on firearms, please refer to the following article and its accompanying references, Factors Affecting the Recovery of Latent Prints on Firearms, Barnum, C. and Klasey, D., *Journal of Forensic Identification*, Vol 13(3), May/April 1997, pp. 6-9.

<http://www.scafo.org/library/130303.html>



Latent Fingerprint Section

Mariana Ward (Sup)
Steven Burke
Bridget Driver



Hints on Evidence!

The convenience of using electronic versions of the NSP evidence submittal forms (750 and 750A (DNA only)) makes it easy to submit evidence to the crime lab. However, we are seeing an increase of agencies/officers either copying and pasting information or simply reusing the electronic submittal forms for multiple cases **but not updating the agency numbers or the case scenario**. This practice is unfortunately causing numerous difficulties and bottle-necks in the case check-in process. **As a reminder, please be mindful and proof-read your evidence submittal forms prior to submission of evidence - double-check suspect/victim names, case occurrence dates, case scenarios, agency case numbers, and the list of evidence items for accuracy! This practice will help ensure that your case does not get unnecessarily hung up in the system!**



Spotlight on Forensics - Sarah Zarnick (Firearm/Toolmark Section)



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Hometown: Crete, NE

Education: B. S. in Criminal Justice from the University of Nebraska at Lincoln
Master of Forensic Science from Nebraska Wesleyan University

Work Experience:

Nebraska State Patrol - Headquarters Troop Evidence Technician, Lincoln, NE (February 2006 - March 2007).

Nebraska State Patrol - Crime Laboratory (NIBIN Technician - Firearms Section), Lincoln, NE (March 2007 - September 2009).

Nebraska State Patrol - Crime Laboratory (Forensic Scientist - Firearms Section), Lincoln, NE (September 2009-Present).

Things I enjoy: Spending time with my family, playing sports, reading, and scrap-booking.

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