SUMMER 2015

THE
CRIMESCENE
NEWSLETTER OF THE LAKE COUNTY CRIME LABORATORY

Rebecca Silverstein: The Lab's Silver Bullet

BY ROBERT SBERNA

Like many of her colleagues at the Lake County Crime Laboratory, Becca Silverstein discovered her interest in science at a young age.

"As long as I can remember, science and math were my two favorite subjects in school," said Silverstein. "I was the quiet kid who kept my head down and focused on my school work."

Silverstein's proclivity toward science, however, has deep roots. She is the proud granddaughter of aviation icon Abe Silverstein, who helped found NASA and directed programs that put the first man on the moon.

In spite of her scientific talents and lineage, Silverstein's decision to pursue forensic science as a career wasn't solidified until she began watching the CSI television shows.

"From that point on, I had it set in my mind that I was going to become a forensic scientist," she said. "Throughout the remainder of my high school career, my course load focused as much on science as possible."

Silverstein, who joined (CONTINUED ON PAGE 3)

Rebecca Silverstein

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Stopped Mid-Cycle

BY ROBERT SBERNA

In the early 1900s, French forensic scientist Edmond Locard formulated the basic theory of forensic science as: "Every contact leaves a trace."

Locard's theory, which is often referenced on "CSI" and similar TV shows, holds that a perpetrator will inevitably deposit traces of evidence at a crime scene, and also leave the scene with evidence on his or her person, footwear or clothing.

A century later, Locard's concept continues to be an important element of crime scene investigations, as it was on May 31, 2007 when Lake County Crime Laboratory scientists processed the scene of a brutal murder in Painesville.

(CONTINUED ON PAGE 5)

Frequently Asked Questions

This Column Answers Questions Commonly Asked of our Scientists

ANSWERED BY LINDA ERDEI, M.S.
LABORATORY DIRECTOR

Q: May I ask for expedited results?

A: Yes, the Lake County Crime Laboratory will take requests for expedited evidence processing. However, please keep in mind that not all of your cases can be expedited. Please request priority testing only when absolutely necessary, as your priority case will delay the analysis of all other cases.

The Crime Laboratory strives to assist the local law enforcement agencies by quickly completing any/all testing of evidence. While our goal is to provide accurate and complete results as quickly as possible, unless you advise us, we may not be aware of your need for a particular test result to be completed in an expedited manner. If you need results for a court hearing or to continue your investigation and this information is known at the time of submission, you can enter the date the results are needed and reason for expediting the case on the evidence submission form. If dates are not known at the time of submission, please call and let us know. We may have preliminary results we can provide, or we may be able to move the evidence to the front of the queue.

It may be possible to complete drug testing the same day evidence is submitted, depending on the suspected drug and the amount of the items submitted. Evidence such as suspected cocaine, marihuana, or heroin, can usually be completed quickly. However, evidence such as mushrooms, LSD or synthetics of any type could take significantly more time to complete.

Many cases necessitate multi-disciplinary testing requiring additional time for completion. Testing must be completed in the proper order to ensure that the most complete results are obtained. There are some types of testing that are impossible to complete in a day or two, such as Toxicology and DNA. These tests are more complex, requiring more time to complete. We are still willing to expedite these types of tests when the occasion warrants it, so let us know.

We are happy to work with you whenever possible to assist you in your investigation.

If you have any questions, please contact Linda Erdei, Laboratory Director, at (440) 350-2793 or lerdei@lakecountyohio.gov.

Lake County Crime Laboratory Provides Crime Scene Training

The Lake County Crime Laboratory is fairly unique in that our crime scene team is comprised of the laboratory scientists and examiners that will come to the crime scene and process and collect evidence for you.

There may be times when your agency wants to process its own crime scene. However, you may have new officers, who are uncertain about how to collect and package an item. They may also be unaware of what the crime laboratory can do with that particular type of evidence.

To help answer these questions, the crime laboratory offers training in evidence collection, and will explain what we can do with the evidence back at the laboratory. Our team will come to your location and provide training that suits your needs, whether it is an hour long training session at shift change regarding shoe print collection, or a full day of hands-on training on fingerprint processing.

Mentor evidence technician training class.

We have found that (CONTINUED ON PAGE 8)

Rebecca Silverstein: The Lab's Silver Bullet

Continued from Page 1

HIGHLIGHTS

- Member - International Association For Identification
- Member - Midwestern Association of Forensic Scientists
- Member - Ohio Identification Officers Association
- Member - Association of Firearm and Tool Mark Examiners
- Member - Cogent User Group International
- Graduate - ATF National Firearms Examiner Academy, 2013-2014

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the Crime Laboratory in 2012 as a fingerprint and firearms examiner, attended high school near Toledo and graduated from Ohio Northern University, where she earned a Bachelor's degree in Forensic Biology with a minor in Chemistry. Silverstein also competed on Ohio Northern's cross country and track teams.

As a forensic analyst, her wide range of duties at the Crime Laboratory include processing, developing and analyzing latent prints, and searching prints through the Automated Fingerprint Identification System (AFIS) database.

The AFIS database contains the fingerprint and palm print records of arrested individuals. With AFIS, users can electronically search images of latent prints collected from crime scenes. Within minutes, AFIS can return information on any potential fingerprint matches in its database.

Silverstein is also a member of the Crime Laboratory's Crime Scene Investigation team, specializing in fingerprints and firearms. Her work as a firearms examiner involves analyzing identifying characteristics of guns, particularly the rifling and toolmarks.

A gun's rifling pertains to the spiral grooves cut inside its barrel. The grooves impart spin to the bullet, which serves to stabilize its flight. Bullets fired from rifled guns acquire a unique pattern of grooves and striations that correlate to the gun barrel.

Toolmarks are the impressions caused by contact between two objects of differing hardness. For example, in the case of firearms, a cartridge case is made of a softer metal than a gun's firing pin, so the firing pin leaves a distinct tool mark when it strikes the bottom of the case.

Silverstein uses a special microscope to do a side-by-side comparison of ammunition recovered from a crime scene with ammunition that has been test-fired from a suspected firearm. The results can help determine if a specific gun was used in a crime.

Only three years into her forensic science career, Silverstein has worked hard to enlarge her knowledge base. She has attended numerous seminars and training classes in areas including latent prints, crime scene investigation, and courtroom testimony. She is active in several professional organizations and has conducted presentations and training classes at conferences and at the Crime Laboratory.

In 2013-2014, Silverstein was among a small group of forensic scientists selected to attend the prestigious ATF National Firearms Examiner Academy (NFEA). During the one-year program, she received intensive training in firearms identification, bullet path analysis, bullet examination and comparison, toolmark examination, gunshot residue, serial number restoration, and other topics. The participants also studied laboratory protocol, safety and ethics, and gained (CONTINUED ON PAGE 4)

Rebecca Silverstein: The Lab's Silver Bullet

Continued from Page 3

expertise in providing courtroom testimony about their scientific conclusions.

Saying the NFEA program was a "once-in-a-lifetime experience" that provided a great foundation for her career, Silverstein credited the Crime Laboratory for nurturing her professional growth.

"I enjoy being able to go to various conferences and educational programs," she said. "Without the support of the Crime Laboratory, I wouldn't be able to take advantage of these opportunities."

She added that her fellow scientists at the Crime Laboratory have been great resources and mentors in her development. "They've been a wonderful group of people to work with. Whenever I have a question, I know that I can always approach someone and be able to consult with them."

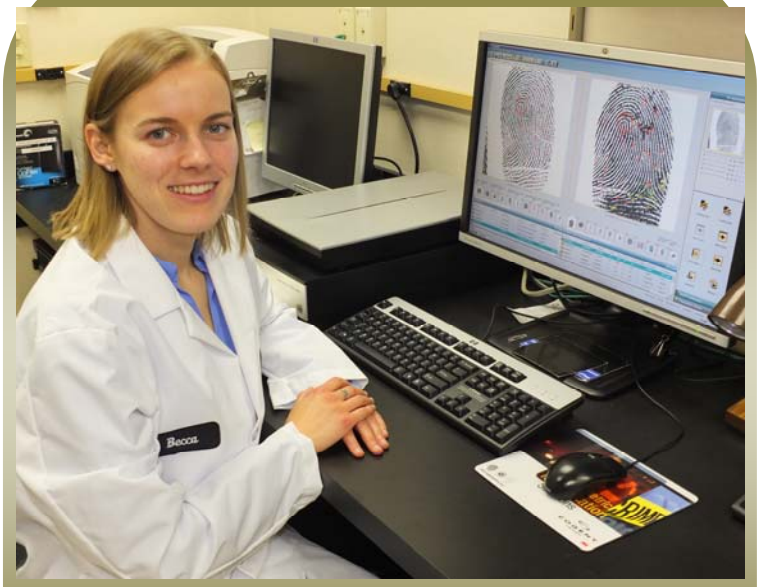
Silverstein's passion for forensic science is evidenced by her determination to gain her first job in the field.

"The road to my job here at the Crime Laboratory encompassed about a year and a half after I graduated from college," she said. "I wanted to work as a forensic scientist, no matter the discipline, so I applied to laboratories throughout the country and interviewed in many different states. The journey took me south to Florida, west to Missouri, east to Maryland, and north to Illinois. I was fortunate to be offered a position at the Lake County Crime Laboratory in July of 2012. I was thrilled to find a job in my home state, especially because the majority of my immediate family is located in Ohio."

Silverstein was well-prepared to enter the forensic field. While still at Ohio Northern, she completed an academic externship with the Ohio Bureau of Criminal Investigation at its London, Ohio laboratory. She worked alongside BCI's forensic scientists in the latent print, chemistry, and firearm and tool mark sections. Her work with BCI Forensic Scientist, Heather Williams, on a gunshot residue study resulted in a paper that was published in 2011 in AFTE Journal, the official publication of the Association of Firearm and Tool Mark Examiners.

Silverstein said forensic science has been a rewarding career. "I find it gratifying to put the work in and see the results of my efforts. I also like being able to use science to aid police investigations and help solve crimes."

However, she advised aspiring forensic scientists that the field is not as glamorous as it's depicted on TV shows.



Becca operating AFIS.

"The reality is that there is a lot of paperwork," she said. "There's a lot of nitty-gritty work that you don't see on TV. We do a lot of reports and we have to make certain that our scientific results are conveyed to law enforcement agencies and juries and that they can be understood."

She added that students pursuing forensic science should consider taking public speaking and communication courses.

"If you're in the position of testifying in court, it's important to be able to effectively communicate your results," she said. "It can be intimidating to testify as an expert witness. It was one of the challenges I had to overcome. But I also realize that it's a great opportunity to teach the jury what we do."

Outside of the laboratory, Becca is an avid runner and reader. She loves to travel, spend time with family and friends and enjoys exploring the Northeast Ohio area. She is active with the Northeast Running Club, a diverse and enthusiastic group of local runners and walkers, and serves as its Vice President. A runner since middle school, Becca enjoys participating in local races year round and will be running her first full marathon this fall in Columbus.

Stopped Mid-Cycle

Continued from Page 1

Lisa's body had been discovered by her boyfriend, Thomas, in the back yard of his University Avenue condominium. Lisa, 44, and her two young children had moved into Thomas's two-story condominium several months earlier.

Thomas told Painesville Police that he had finished his pre-work shower at 5 a.m. when he realized that Lisa was missing. In the living room, he saw blood on the couch and a bloody handprint on the wall. He told police that when he first noticed Lisa's unclothed body lying in his back yard, an unidentified man dressed in black clothes was standing over her. Thomas saw the man run from the scene, and then reappear across the street in the parking lot of an apartment building. Thomas watched as the man entered what was later determined to be Paul Hudson's apartment.

In Thomas's back yard, police officers observed that Lisa had been severely beaten with a blunt object. She had also been stabbed nine times in her neck and torso. The officers noted that Lisa's jaw was smashed and she had numerous bruises on her body, possibly caused by her killer's feet. Lisa's bloodied jean shorts and bra were found nearby.

With the Crime Laboratory's Linda Erdei, Dave Green, and Stephen LaBonne on route to the scene, police set up a perimeter around the apartment across the street from the crime scene. Assisted by the Lake County Sheriff's Office and the Fairport Harbor Police Department, Painesville officers took the apartment's resident, Hudson, into custody.

Hudson, 56, had been released from prison two years earlier after serving 18 years for robbing a Painesville store. While committing that crime, he fired a gun at one of the patrons and attempted to shoot a responding officer.

During a search of Hudson's apartment, Painesville Police discovered a pocket knife with what appeared to have dried blood on it. An officer also heard the washing machine running, which he considered suspicious at that early hour, particularly because Hudson had told police he had been sleeping when they first arrived, and Hudson's wife said that he never washed clothes. The washing machine was stopped in mid-cycle. Inside the washer, the Painesville Police discovered a pair of tennis shoes, a bandana, a t-shirt, a leather belt, a pair of boxers, a pair of socks, a knit cap and one glove. The glove appeared to match a bloody glove found in Hudson's back yard. With Hudson quickly emerging as a suspect, police now believed that he was washing his clothes to destroy evidence. The remaining water from the washing machine was filtered for possible hair evidence by Painesville Police Detectives assisted by Laboratory personnel. The items were quickly removed from the water, and allowed to dry on clean plastic bags, in order to preserve any DNA evidence that might be present. Later, DNA analysis confirmed that it was in fact the victim's blood on the shoes and the single glove.

Washing machine containing Hudson's clothing.

Erdei, who is the Crime Laboratory Director, and LaBonne, a DNA Analyst, then went to Thomas's condominium and began photographing and collecting blood and other physical evidence. Green, a Criminalist, collected fingerprints and trace evidence such as hair and fibers.

"We found several clumps of hair on the rear deck of the condominium," said Green. "It looked like large amounts of hair had been yanked out of Lisa's head."

On the wooden railing that encircled the deck, Green found a tangle of sandy brown hair snagged on a splinter. Police detectives theorized that Lisa's killer entered the condominium through the unlocked sliding door while Thomas was showering. Bloodstain evidence indicated that she was attacked inside the condominium and then dragged out the back door and either thrown over the wooden railing or pulled over, perhaps by her hair. During the attack, Lisa's children were asleep in their upstairs bedroom.

(CONTINUED ON PAGE 6)

Stopped Mid-Cycle

Continued from Page 5

After being found guilty of Aggravated Murder, Hudson was sentenced to serve a prison term of 30 years to life in prison.

Green also focused his attention on bloody shoeprints found on Lisa's body and on her jean shorts. Green compared Hudson's shoes to shoeprint impressions taken from Lisa's body. He determined that there was sufficient similarity in size, shape and tread design to conclude that Hudson's shoes may have been the source of the impressions.

However, Green said that he would have needed a more detailed impression to make a definitive determination.

"Skin and clothing are elastic and don't always show impressions in fine detail," he explained. "If given a choice, I'd prefer that the perpetrator step on glass or paper as they are leaving a crime scene. Those are good surfaces for a shoeprint."

LaBonne was able to extract DNA samples from blood on the work glove and shoes recovered from the washing machine, and Hudson's pocket knife, recovered from his apartment. The items recovered from Hudson's apartment and from the washing machine were extremely incriminating because they contained Lisa's blood, which was confirmed by DNA analysis.

Green also examined the pocket knife, focusing on a long strand of hair that had been stuck on the blade. Using a comparison microscope, he determined that the strand shared consistent characteristics with a sample of Lisa's hair.

During their investigation, Painesville Police learned of Hudson's likely motive for murdering Lisa. Lisa and Hudson had been having a sexual relationship. Three weeks before her death, Lisa discovered that Hudson had stolen $500 from her. Lisa confronted him about the theft and had taken steps to report the theft to police but had requested no action at the time. In addition, Hudson was on parole. Lisa had told a friend that she was thinking of threatening to go to Hudson's house to tell his wife about the affair in an effort to get him to pay her back. During questioning of Hudson he made a comment to police stating "when my wife finds out about this affair, I will have no life." Police believed in order to keep Lisa from disclosing the relationship to his wife, that during an argument, he violently murdered her.

On August 10, 2007, the Lake County Grand Jury indicted Hudson for aggravated murder and other charges. Two months later, he entered a guilty plea. He was sentenced to life in prison with no possibility of parole for 30 years.

The trail of evidence left by Hudson was instrumental in identifying him as the perpetrator of a terrible act. The Crime Laboratory's diligent analysis of that evidence helped to ensure that a violent repeat offender will likely spend the rest of his life behind bars.

Hudson's knife containing Lisa's hair and blood.

Bloody shoeprint located on Lisa's body.

DNA: Touching All Crimes

BY DR. KAREN ZAVARELLA

No case is too small for touch DNA at the Lake County Crime Laboratory. DNA analysis at the Crime Laboratory utilizes state of the art equipment to assist agencies with crime solving. One of the unique offerings of the Crime Laboratory is the analysis of touch DNA evidence on property and drug-related crimes in addition to violent offenses. Touch DNA evidence originates from skin cells and is not necessarily visible to the naked eye. Thus, collection of such evidence takes a little more of an investigative eye and skill. The Crime Laboratory has had great success in assisting agencies in criminal investigations with many types of touch DNA evidence. This success is due to the thorough evidence collection by the investigators. The investigators' understanding of "good" touch DNA evidence collection is evident in those that have taken advantage of training that the Crime Laboratory offers year round. For example, a Willoughby officer collected a swab from a safe where he noticed an odd colored stain that he believed may contain scraped off skin cells or perspiration from the suspect. This swab ultimately generated a DNA profile that "hit" to a convicted offender across the state line through CODIS (Combined DNA Index System). CODIS hits are generated multiple times a month on non-violent criminal touch DNA evidence.

A majority of the DNA cases that are brought to the Crime Laboratory involve at least one item that is "touch" DNA evidence. Many types of touch DNA evidence have produced profiles that have confirmed a link between a known suspect and a case, or generated a "cold" hit to an unknown suspect through CODIS. A touch DNA sample from a homicide scene collected by Dr. Zavarella from the exterior door handle generated a profile that proved to be the only physical link of a potential suspect to the grizzly scene. In another homicide case, a touch DNA profile from the exterior of the jeans worn by the victim produced a mixture of the victim and suspect, providing strong evidence for the prosecution in a criminal trial that ultimately convicted the suspect. A threatening letter handed to a bank teller was swabbed by Dr. Zavarella and generated a profile that confirmed the identity of the suspect in custody for the crime.

Tens of thousands of skin cells are shed daily by humans and potentially, these cells transfer to any surface an individual touches. The following are some examples of touch DNA items in which a DNA profile has been successfully developed: tape (both the adhesive and smooth sides); tools such as pry bars, hammers, and screwdrivers used to force entry into homes, businesses, and safes; smudged prints from business countertops and burglarized cars; drug baggies, paper folds, prescription bottles, and syringes containing illicit substances; articles of clothing such as hats, gloves, shirts, and coats left behind at a burglary; weapons such as guns and knives have also proven to be good sources for touch DNA evidence. Investigators are encouraged to submit the evidence when possible for the laboratory analysts to examine and swab. Alternatively, investigators can swab larger, immovable items and submit the swabs as evidence. The DNA analysts at the Crime Laboratory are always available for consultation when an investigator has a question regarding evidence collection.

Dr. Zavarella collecting touch DNA.

The Crime Laboratory provides the highest level of analysis given to all crimes committed throughout the county. When an individual's personal property has been compromised, our promise is to do our best to help solve the crime. Outside agencies can submit DNA evidence from property crimes for a fee. Please contact Linda Erdei or Dr. Zavarella at the Laboratory with any questions regarding the collection of touch DNA evidence or to schedule training at (440) 350-2793.

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An ASCLD/LAB-Legacy Accredited Laboratory 2000-2009

Lake County Crime Laboratory Provides Crime Scene Training

Continued from Page 2

officers trained in a particular processing technique will soon use their newly developed skills at a crime scene. For instance, several years ago, we trained officers on how to collect shoeprints and then we were quickly receiving numerous shoeprint castings and lifts. This evidence can help to link cases to each other, even across local agencies, which may help to solve the crime. Often the training increases awareness of a particular type of evidence, and the officer is more likely to detect and properly collect it at a crime scene.

In March, a week long training session was organized by Mentor Detective Ed Zigman. Detective Zigman commented, "We had 21 students from Lake County… the continued cooperation between the Lake County Crime Lab and our area departments is extremely beneficial to all. I have been instructing since 2002 and because of your help and assistance we have turned out some of the best and well trained individuals to help solve crimes and convict criminals here in Lake County." The training included all disciplines: fingerprints, firearms, DNA, trace evidence, controlled substances, toxicology and digital evidence. On the last day of the training, Mentor Detectives Zigman, Haller and Radigan created three crime scenes so the attendees could do hands-on exercises in the casting of shoeprints, proper collection of firearms, bloodstain pattern recognition, creating impressions from toolmarks, and lifting of latent prints. From the comments received, we realize that this type of training is essential in Lake County. It allows the students to ask questions and learn the true value of the evidence.

The Crime Laboratory was happy to receive such a positive response to this joint training session.

If you would like to discuss training in the collection and preservation of evidence for your Lake County Agency, please contact Laboratory Director, Linda Erdei at (440) 350-2793.

The CRIMESCENE

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