

FORENSIC LABS

/Abbie Darst, Program Coordinator

FROM SUBMISSION TO SOLVED



The harsh, deep bruise marks stretching across her throat signaled her struggle as the life was choked from her body. Only 20 years of age and a single mother, Ebony Smith lay lifeless on the bed in her bedroom when Lexington detectives arrived. Her strangled remains, still laced with her favorite necklace, were all that was left to signify the life that once was.

It was May 2005 and leads on Smith's killer soon surfaced as witnesses recalled a meeting between a man, later known to be Ondra Clay, and Smith earlier that evening during a barbeque. Clay was a suspected serial rapist who

It seemed as though Clay's extreme precautions would allow him to literally get away with murder until Lexington detectives, on the advice of the DNA analyst, took a chance that the same necklace surrounding her neck when she took her last breath may hold the evidence that would blow the case wide open.

"Absolutely, we were able to get a beautiful male profile from the necklace where he had choked her," said Marci Adkins, a biological analyst at the Kentucky State Police Central Forensic Laboratory in Frankfort.

Using the skin cells embedded in the seams on Smith's herringbone necklace from where her assailant had wrapped his arm around her throat to strangle her, Adkins was able to complete the process of extracting DNA to obtain a DNA profile, identifying Clay as a one in 361 quadrillion match. Clay was convicted of Smith's murder and sentenced to life in prison.

In her 10 years working in the forensic lab, Adkins and her colleagues have uncovered hidden information locked inside thousands of pieces of evidence that have been submitted to the lab system by law enforcement agencies across the state.

But for the biologists and chemists who sit on the benches at Kentucky's six labs, there are certain pieces of evidence and certain cases that stand out as especially unique, strange, amusing or rewarding.

Ryan Johnson, the tech leader in the Central Lab's toxicology section, recalled a case in Scott County referred to as the yellow-jacket case because the area has a particular soft drink called the yellow jacket. In this case, two girls claimed to have become intoxicated from the drink.

"Few people know that a lot of sodas use alcohol as a binding agent, so some sodas still contain trace amounts of alcohol," Johnson said.

Though the amount of residual alcohol is negligible, the toxicology section tested numerous cans of the yellow jacket soft drink to verify the amount of alcohol existing in the drinks was indeed insignificant. Running tests on soft >>



/Photo by Elizabeth Thomas

▲ Cuttings from items of evidence are placed into these microcentrifuge tubes. Later chemicals are added, which burst the cells that are present, releasing the DNA into solution.

had already been acquitted of two rapes in the Lexington area.

"He is a true sociopath: arrogant, grandiose ideas of himself, intelligent, articulate, can play the game – he is a bright guy," said Lexington Division of Police Detective Paul Williams. "... He watches a lot of the CSI shows ... he would do things like stay totally clean shaven including head, arms and genitals so that there was no hair for fiber evidence. He would wear long sleeve shirts and gloves."



/Photo by Elizabeth Thomas

▲ Kim Huff, an analyst in the DNA Database Section of the Central Lab, runs a machine that allows the Database Section to batch many of their DNA samples during processing. Unlike the DNA Casework Section, database receives DNA buccal-swab or blood samples from the Department of Corrections or Department of Juvenile Justice to be entered into the CODIS database.



/Photo by Elizabeth Thomas

▲ A DNA analyst in the Central Lab's DNA Casework Section handles test tubes used during the DNA analysis process.



drinks was definitely a break for a section, which ordinarily tests for urine and blood.

In the solid-dose drug section, analyzing and testing marijuana, methamphetamine and cocaine are near daily occurrences.

"When you first start the job, your initial reaction is, 'Hey, I'm playing with stuff everybody else goes to jail for,'" said Jeremy Triplet, a chemist in the Central Lab's drug section. "But then it gets pretty routine and it is not as cool to be dealing with cocaine and these other more common drugs."

For these analysts, it is the unique-types of drugs that are being manufactured in clandestine labs or their packaging that makes a case stand out from the rest, Triplet said.

"They are not just manufacturing meth anymore, these people come up with all kinds of drugs to make at home," Triplet explained. "If we come across a new drug, we have to find out if it is controlled or not, and that can shake up your everyday routine and be exciting and fun."

The way the drugs come in can often keep analysts on their toes. From prison letters, to battery-shaped spheres, to large bags of urine kept and stored for recycling previously ingested meth, the chemists in the drug sections across the state stay entertained with the ingenuity and sheer stupidity of some of Kentucky's drug offenders.

On one hand, not all drug cases end in a conviction for trafficking, cultivating or possession – their technology also can rule out the presence of any illegal drugs. Susan Robertson, a chemist in the Central Lab's drug section, once worked a case in which a woman's home in government housing had been inspected. Inspectors found what appeared to be a rolled marijuana joint. She was kicked out of her apartment and nearly charged with possession before Robertson verified that it was made of nothing but tobacco and was actually a self-rolled cigarette, something the woman did on a regular basis.

"I felt bad for her," Robertson said. "I hoped that she was able to get her home back because

she hadn't done anything wrong."

On the other hand, the state's DNA database analysts deal only with adjudicated cases where a serious crime has been committed and the responsible party has been sent to jail or prison. For this reason, the database section of the lab differs from other sections in that they do not receive pieces of evidence for analysis and the samples they have cannot be used for evidentiary standards. But they help bring justice to criminals and closure for victims and families just as much as any of the other laboratory sections.

The DNA database section receives buccal-swab or blood samples from the state's Department of Corrections and Department of Juvenile Justice of those in Kentucky's prisons who have been convicted of a felony. Whether an individual committed a sex crime, burglary or murder, 2008 legislation made it mandatory to obtain a DNA sample from every convicted felon. These DNA profiles are put into a DNA database and can be used as a source to link known offenders to unsolved cases, said Stacy Warnecke, a biologist in the Central Lab's DNA database section.

Trevor Johnson's case is one Warnecke will never forget. Johnson was entered into the Combined DNA Index System, or CODIS, in 2003, when he was convicted of two counts of sexual abuse after fondling two 16-year-old girls at a Kmart in Georgetown. Once in the system, his DNA was checked against other cases, and database analysts matched Johnson to five unsolved rape cases in Woodford, Scott and Anderson counties from a decade before.

"Where else can you get a job where you feel like you're helping more than this?" Warnecke asked. "I'm sure if you're a doctor or in the medical field maybe, but you just feel like you are doing something useful every day."

Woodford County sheriff's deputy, Joe Carter, then a detective for the Woodford County Police Department, worked one of the original rape cases in Woodford County in November 1996. For Carter, the case took on an extra



level of importance because he had a personal connection to the victim. He and another Versailles officer were working together on the two Woodford County rapes. When they took their evidence to the Frankfort lab, they, by chance, ran into a Lawrenceburg police officer with information on a rape in Anderson County.

After comparing notes, the three officers decided to ask the lab analysts to run the results from their three cases against one another. The result gave the officers a definitive connection to their cases — they all were looking for the same offender. But it would be more than 10



/photo by Lawrence Pilcher

▲ Lodged in the bullet above is a single zipper tooth, picked off when the bullet went through a jacket. Bullets also can pick up pattern characteristics of materials they pass through.

years later after Carter retired from the Woodford County police and went to work part time at the county sheriff's office that he got a final answer and closure in the case.

"It was like Christmas," Carter said about the day he received the call that there had been a hit in the DNA database to his decade-old case. "I was just elated to give [the victim] closure and let her know that someone was going to go to prison for what they had done to her."

That same sense of justice is what motivates

Warnecke and the other database analysts.

"I think knowing that what we are doing here is actually reaching people out there and giving them some justice when before — I cannot imagine living in that kind of fear and thinking that person's still out there," Warnecke said. "I think it is very rewarding."

Across the board, the biologists and chemists who work in Kentucky's forensic laboratories are there for the same reason — the rewarding sense of assisting law enforcement to effect justice. In an effort to provide the best results possible for detectives around the state, the analysts in return need officers to provide them with the best possible evidence to test.

In DNA casework, the newest rage seems to be about touch DNA, which in its most literal sense is DNA from fingerprints, Adkins said.

"But that doesn't really work, unless someone has touched something with a really rough surface like a tire iron in the commission of a crime," casework analyst Adkins said. "Though we have successfully gotten DNA profiles this way, the take home message to officers would be, by all means think outside the box as you approach your crime scene, but do not get so hung up in this touch DNA stuff that you are overlooking better sources of DNA at the scene."

Similarly, analysts in the trace section of the lab urge officers to think outside the box when submitting evidence for trace examination.

"Law enforcement agencies do not know what all we can do, so there is a lot of evidence that we do not get," trace biologist Lara Mosenthin said.

In today's culture, it seems that most officers are thinking about DNA evidence, especially in homicide cases, but they do not always think about the trace evidence like fiber transfer if someone was thrown into the trunk of a car or duct tape residue on the skin from where a person may have been tied up with tape, Mosenthin explained.

"That's why we are called trace," she said. >>



/Photo by Elizabeth Thomas

▲ The Firearms Section of the Kentucky State Police Central Lab has a wall of hand guns used for comparison in an investigation. When a bullet is fired from a gun, the lands and grooves in the gun barrel and the direction of the spiral leave a specific pattern on an ejected bullet that allow analysts to identify which type of gun shot the bullet. The Firearms Section keeps various guns and bullets to use as standards in their analyses.



/Photo by Elizabeth Thomas

▲ Trace Chemist Jack Reid looks through a high-powered microscope at Frankfort's Central Laboratory. Reid's specialties in the Trace Section are hair, paint, fiber, glass and physical matches. Fire debris, gun-shot residue and arson cases are other areas of expertise for trace analysts. The Trace Section can analyze almost any type of material from small cans or evidence gathered in a trace kit to large truck grills.



"You are not going to see what we are looking for ... we are looking for stuff that you are not going to see with the naked eye. In addition, in a lot of homicide cases, with the blood and the DNA you can prove that someone's blood is on someone else's clothing, but sometimes with trace, we can go beyond that and show how something happened as opposed to that it happened."

For this reason, analysts in both the DNA casework and trace sections recommend officers give them as much background information and paperwork on a case as they can.

"The more information they give us the better because we base our analytical decisions on the case history, so everything they tell us we process and that helps us to make educated decisions throughout the testing process," Adkins said.

This exchange of information is a two-way street. Analysts also encourage officers to call

whenever they have questions about anything from what to collect and what can be processed to how to collect the evidence and how to package it.

The years of experience locked inside each analyst is a wealth of useful information for investigating officers to draw from, allowing each party's expertise to come together to collect, test and turn out the best possible evidence for each case.

"Just call and ask us before the case is processed, it is much more helpful because once it's done wrong, it is done, and the evidence is lost, destroyed or contaminated," trace analyst Jason Berry said.

No matter how disturbing, disgusting or droll the evidence, Kentucky's forensic analysts are up to the task to decipher it and help law enforcement officers and prosecutors bring justice and closure. J

Contacts and Capabilities

Central: Frankfort
Commander – Maj. Ricki Allen
Manager – Laura Sudkamp
(502) 564-5230

- Blood Alcohol
- Toxicology
- Breath Alcohol Maintenance
- Solid Dose Drugs
- Trace/GSR/Arson
- Firearms/Toolmarks/Imprint Evidence
- DNA Casework
- DNA Database
- Photo
- Polygraph
- Forensic Video Analysis

Northern: Cold Springs
Commander – Lt. Mike Smith
Supervisor – Jeanna Oxenham
[859] 441-2220

- Breath Alcohol Maintenance

- Blood Alcohol
- Solid Dose Drugs
- Forensic Biology Casework Screening
- Polygraph

Eastern: Ashland
Commander – Lt. Mike Smith
Supervisor – Larry Boggs
(606) 929-9142

- Breath Alcohol Maintenance
- Blood Alcohol
- Solid Dose Drugs
- Firearms/Toolmarks/Imprint Evidence

Southeastern: London
Supervisor – Steve Morris
Commander – Lt. Mike Smith
[606] 877-1464

- Breath Alcohol Maintenance
- Blood Alcohol
- Solid Dose Drugs

Western: Madisonville
Commander – Mark Mayes
Supervisor – David Hack
[270] 824-7540

- Breath Alcohol Maintenance
- Blood Alcohol
- Solid Dose Drugs
- Forensic Biology Casework Screening
- Polygraph

Jefferson: Louisville
Commander – Lt. Mark Mayes
Supervisor – Terry Comstock
[502] 426-8240

- Blood Alcohol
- Solid Dose Drugs
- Forensic Biology Casework Screening
- Firearm/Toolmarks/Imprint Evidence.



/Photo by Elizabeth Thomas

▲ DNA Database Analyst Kim Huff adjusts a machine that processes DNA samples for the section, unlike the DNA Casework Section, which processes DNA samples by hand. In 2007, the Database Section received nearly 15,000 DNA samples to be added to the CODIS databank after the passage of House Bill 289, which required that DNA samples be collected from all Kentucky convicted felons.

The DNA Bill (HB 289)

Last year, Kentucky's DNA database took a giant leap forward, joining nearly every other state in collecting DNA samples from all convicted felons held in Kentucky's prison system, local jails and state juvenile justice facilities.

In 2007, House Bill 289 made amendments to KRS 17.170 requiring the collection of DNA from any person, including any juvenile, who was convicted on or after July 1, 2008 of any felony offense, or who is in the custody of the Department of Corrections, the Department of Juvenile Justice, or a local or county jail on July 1, 2008 for conviction of a felony offense. The amendment also extended to those who are on probation, parole, conditional discharge, conditional release or diversion for a felony offense that occurred prior to July 1, 2008.

Prior to the passage of this bill, Kentucky's DNA database contained approximately 14,000 individuals. In the months since the amendment's enactment, the Kentucky State Police Forensic Laboratory's database section has received more than 15,000 additional samples to add to its database — more than doubling its previous database size.

Though this sudden influx exponentially increased their work load, the biologists in the DNA database section of the lab system were thrilled with the bill's passage.

"For us to be so far behind, we were just like, come on people, wake up," said Davey McCann, a biologist in the DNA database section. "So if it would not have passed, it would have made a big difference in Kentucky, just for the database within itself for that many more samples to not get into the database."

"We would have been very disappointed if it had not passed," agreed Regina Robinson, who also works in the database section.

Because the influx of samples into the database section was so immense, analysts said they cannot yet tell what impact last year's legislation has made. However, statistics from other states show a large increase in arrests when their databases include all convicted felons' DNA samples.

"What we've seen in other states is that they've averaged, once this database is instituted and built up, they will average an additional 60 to 80 arrests, per year, of felons, repeat felons," KSP Commissioner Rodney Brewer said. "So we know, statistically speaking, that about 62 percent of burglars are ... recidivists and sexual offenders are often recidivists."

Up until 2003, only DNA samples from sexual offenders were collected and entered into the database. When violent offenders and burglars were added, the database samples received rose from approximately 500 per year to 1,500 per year, and lab personnel saw DNA database hits jump dramatically. That number is headed for another huge jump going from 1,500 samples received each year to 15,000+ that they received last year and may match this year, said Stacy Warnecke, DNA database analyst at the Central lab. ■