

# UNLOCKING EVIDENCE

Kentucky State Police Central Laboratory director and manager offer tips for officers in evidence submission

/Abbie Darst, Program Coordinator

**W**ith only a \$1,200 comparison microscope and a mere budget of \$600, the Kentucky State Police created the state's first forensic laboratory in 1951. From day one, the lab offered its services free of charge to any city, county or law enforcement officer in the commonwealth. Today, the lab system still provides law enforcement with the unique tools necessary to promote justice, solve mysteries and right the wrongs of our society.

In the midst of high-powered equipment and high-quality expertise stand the men and women whose education, skill and concern for justice ensure Kentucky's forensic laboratories' services remain reliable and reputable.

Maj. Ricki Allen, named lab director in November, along with Central Lab manager, Laura Sudkamp, address how law enforcement agencies and lab analysts can work together to turn evidence submitted into cases solved and justice served.

**The KSP Forensic Laboratories have been in existence for nearly 60 years. How have the services changed over the years?**

**RA:** Laura has been here nearly 20 years, so that is a lot of experience.

**LS:** Basically, the labs used to deal only with firearms and toxicology. Later we expanded and the drug section came in. The fingerprint unit used to be with us, but it is now over at records. But fingerprints, firearms and blood alcohol, what most crime labs started with, are what we started with.

As the investigations improved, the science improved with it, and we started adding things. Trace was added, serology was added instead of just looking at the blood type. They added enzymes to it after awhile and we could actually pull out components of the blood and do a comparison.

Now we have added the DNA. We do not do the enzyming anymore, we don't do the A, B, O anymore, we just identify that it is a body fluid and whether it is human or not. Then we go on with the DNA process.

The Trace Section can do all kinds of things now. It used to be that we would all cringe at the hair analysis. All they used to do was a microscopic analysis and got very intense on everything they looked at with the hair. Still, you can find many people who have the same hair. The process was better at ruling people out than it was saying this one person really did it. But a lot of forensics and criminal cases hung on hair. So now we can do mitochondrial DNA through the hair. >>

/Photos by Elizabeth Thomas

>> What is the biggest challenge facing the lab system? How can those challenges be tackled?

**RA:** I think it is the budget. But that is something that cannot be helped because everything is so expensive out there and you only have so much money, and you cannot rob Peter to pay Paul. A second issue would be the submission of evidence here.

**LS:** The biggest goal in forensic science is to provide the best possible analytical method for any discipline and the newest technology. As you know, whenever a brand new type of TV comes along or when we go, for example, from DVD to Blue Ray, when it first comes out it is amazingly expensive and we have to wait for the prices to come down. Sci-

▼ The Central Lab's Toxicology Section batches many cases together, allowing them to run numerous samples at one time.



ence is that way and worse. Because once you buy this brand new, miracle working piece of equipment, you have to buy the specific chemicals that go with it and those prices do not come down. They only go up.

So we have to struggle between do we expand, do we cut back services, do we not buy the latest and greatest equipment? Typically we do not, we wait for the prices to come down. But at that point, people are seeing it on the news or watching TV shows where the great advancements are out there and we cannot do it because we do not have the money to do it.

**RA:** Everyone always tries to help us. It is not like we are sitting here saying, no one is here to help us. People out there, the legislators, everyone else, they are always trying to do what they can to make sure, since we serve so many agencies across the state, that we get what we need.

**LS:** Bowling Green/Warren County Drug Task Force has grant money and for several years they funded most of one analyst's salary to help pay for the amount of drugs they submit.

Basically, it is the budget and education – trying to get across to people that DNA solves a lot of stuff, but it is not going to solve everything TV is not real, and they need to learn what to submit. The more we can educate on what to submit, the better the cases will be.

**RA:** When we are talking about education of police officers, it's not picking on other agencies. It is included with the state police. Some agencies have several officers that do it correctly and one or two that do not. So it is not everybody out there, but it does include the state police as well.

**LS:** This is an across-the-board education process because they do not know. We are the experts. We deal with it every single day, so we know where you are going to find your best evidence and we know what it takes to get your convictions because we have been there. We have tested 100 pieces of evidence in a case and only used five, then tested 100 pieces of evidence in another case and used the same five. So we know what is going to end up being used in court. Our experience really does preach to that.

How do you think law enforcement officers around the state can better take advantage of the services provided by the labs?

**LS:** We get a lot of cases in. We do lecture the police officers a lot about if it is a misdemeanor marijuana case and the odds are they are going to go ahead and

plead guilty, do not send in the drug evidence until you know. It saves us time, it saves us money and it makes us like you more. It helps us. If we know that officers are helping us with our back log, we tend to establish a better relationship with them.

The same thing goes for the DNA and firearms cases. Do not send in a box full of evidence and say, 'Here, you guys sort it out. You guys figure out what is important and analyze it all.' If you really sit down and look at your case and say, 'The blood on the body is obviously the victim's,' we do not need to test it. If a person is shot, their shirt is going to be bloody. We know that is the victim's blood, but there are a lot of people that will send it in and say, 'Please test to confirm that this is the victim's blood.' We will not do it. It saves us money. At \$400 per sample, we cannot work a whole lot of cases like that. We try to hold it to between five and 10 exhibits for DNA, for that reason — for money and for time. Most analysts can only run 30 to 40 items in DNA each month. If you have a case that has 30 to 40 items, that is just one month analytically to do that. So if we can turn around and instead keep each case to about five to 10 items, you are getting a whole lot more case production, saving a lot more money and still getting the same result.

Also, if they know that their case has plead out, or somebody has dropped the charges, or the grand jury has come back and they will not indict, rather than just leave the evidence in line here, call us, let us know. The analysts just love officers when they do that and in turn, when they have a rush case, we are going to work with them so we can help put it in line and get it expedited.

It is the same as the rest of the world in that it is give and take. If they submit their cases conscientiously, and do not just dump them, they get a better product, a faster run time and we are both happy.

What is the biggest challenge that officers face in submitting evidence for processing through the lab system?

**LS:** CSI. Trying to figure out what is real and what we can really do. Sometimes they have a vehicle that they think a suspect took a dead body in somewhere to dispose of it and they will call and say, 'we want the vehicle processed,' and the question is what do they want done? Then we actually have to walk them through what it is that they think they want because they do not know what to ask for or what can be done. That is probably the biggest issue.

**RA:** The CSI effect is affecting not only the officers submitting, but the public in general. They see

something on TV where they get a blood stain then they put it in a little computer and 10 minutes later not only the name but a photo pops up of who they need. In all actuality, it does not happen that way. But when they go to court, people who are not educated on how the lab process really works, they do not understand why certain things have not been done.

**LS:** It is hard to tell sometimes what is real. There are things that we can do. Can we find cocaine in someone's blood? Yes we can. Can we find it in a dried blood stain on someone's shirt? No we cannot. It is so diluted. One little blood stain – I mean we're getting blood out of a tube and running it. This is just a blood stain here and on TV they are able to pull it, get the DNA out of it and then go back and play with it and get cocaine out of it, and it is just too minute, you can't do it.

So they do not know necessarily what is real because some of what they do on TV is real and some of it is not, or they take it to the next step.

I choose to watch them because people will come into the laboratory or I will get a phone call that says, 'On TV we saw this, can you do that?' and I have to think back in my head of what episode that was. I do not watch all of them, but generally I have an idea of what they saw.

But one of the worst problems we have is when you go to pull a case, especially in DNA, and there is not a standard submitted. They never got the standard from the suspect. Right now if officers do not give us a two-month warning on DNA, there is no way they will get it for court. Because of the way the back log is running, we really need closer to three or four months in order to pull it and get it in line. If that standard is not there, it is just amazing how far it can back you up.

The other big problem is agencies holding their evidence for months before sending it in. You have the ones that come up weekly, and it is not a problem, but others will want you to rush their case. We have judges that are demanding in every county. Everybody has a homicide case, everybody has a rape victim they really care about and we want to solve them all, but we cannot do it. Everybody is going to wait in line at some point. If you want to help that process, get your evidence in immediately.

What do you think keeps officers from getting their evidence in as quickly as possible?

**LS:** Travel time and just getting around to it. They have to do paperwork with it. That goes back to when I said do not just put it in a big box and dump it on us >>

## BEAST Allows for Paperless Reporting

Barcode Evidence Analysis, Statistics and Tracking or the BEAST is a laboratory information management system, which allows the Kentucky State Police Forensic Laboratories to maintain paperless files. The system contains the case information, data and reports from all six state forensic labs. Prior to obtaining the BEAST in June 2007, each lab used its own internal systems, which were identical but could not talk to each other. The six labs mailed more than 40,000 reports per year to investigating officers. Now, with the new BEAST system, they are able to publish lab results on a secure Web site. Also, with this system, the prosecutors are able to see what and when — or if — evidence has been submitted to the labs on their cases.

"We've gotten a lot of kudos on that because they can see what the status is on the case," Central Lab Manager Laura Sudkamp said. "If it is analyzed and waiting on peer review, they know they can call and say, 'hey I've got court in two days, can you get that released?' They'll check it the next day and poof, it's done."

The online system saves the lab paper and postage, while allowing prosecutors and officers to retrieve their needed reports and to monitor case submissions in a timely, efficient manner.

The BEAST is open to every law enforcement agency, commonwealth's attorney and county attorney in the commonwealth.

For more information or to get registered to access the BEAST, contact Laura Sudkamp at (502) 564-5230 or [laura.sudkamp@ky.gov](mailto:laura.sudkamp@ky.gov). ■

>> and make us sort it out. They really need to sit down and go, 'OK, this is probably the most probative. The blood on the shirt is probably the victims, the blood on the suspects shoes is probably the victim's too — we want to send that, but we probably do not need to send the victim's clothing.' They really have to sit down and go through it, and they just put it off and put it off until somebody says, 'You need to get that submitted.'

**RA:** And also what happens with that, a lot of people are short staffed, just as we are, and when agencies are short staffed, they get in more of a hurry to get stuff in because they want to get convictions. It is all in good meaning, but then it backs up because the proper amount of time was not taken.

**LS:** And we were faster than we are right now. But because so much of what we are getting in now is DNA, and a lot of times, they wait for DNA results before they go any further in an investigation. That is one reason there is a big demand on it. A lot of times the investigation will actually stop until they get DNA results, and so we are getting a lot more stuff in — cases that they never would have submitted DNA on before.

**There are six labs across the state that have various capabilities for processing evidence. If budgets were not a concern, do you think it would be helpful for all six labs to offer full-lab services and capabilities?**

**LS:** That would be over doing it. All the labs have blood alcohol and all the labs have solid dose drug identification. The labs with firearms sections run along I-64. It is in three of the six labs, the Jefferson, Central and Ashland laboratories. They handle pretty much all the

process a little quicker and smoother, and the peer review process is done quicker. So, putting analysts at each laboratory would mean that we would have to put a couple of them at each laboratory. At that point we would be wasting a lot of money, and we would have a lot of people sitting twiddling thumbs.

The same thing applies to toxicology. They are able to do it all here. Keeping it in one area allows us to batch a lot of it, and again, that saves money. If we could set it up regionally, maybe one other place would be helpful, but they are really efficient here with what they do. It is the largest section we have in the state.

The other one is trace. There are times that I wish we could have trace in another lab or two, but they have so much equipment that is so expensive.

On one hand, if we were able to put all the analytical disciplines into all the laboratories, it would save your local police officers from having to drive to Frankfort to get their evidence to the Central Lab. On the other hand, it is just not worth it. We would end up having a budget six times what we have now and the people required to do it would be immense. The backlog would be nothing and there would be complete turnaround. But, we would have a lot of people twiddling their thumbs. We would have to about triple our size in order to do it.

**Are there any new initiatives, equipment or services that the lab system plans to add in the near future of which the law enforcement community can take advantage?**

**RA:** We have, I think, the most updated equipment anyway.

**LS:** We stay as current as we can with all our instrumentation. The only thing we are really lacking in is gunshot residue. We are hoping to get a new instrument called a scanning electron microscope. And not only is it a better analytical method, but right now with the method we have, we can only get gunshot residue off the hands. With the SEM, we are able to get gunshot residue off clothing, or, if it went up their nose, we can get it out of there or out of their hair. If an officer thinks it was a drive-by shooting, we can pull it out of the car. Our current tests cannot do that, it is hands only. We can get the residue off gloves, if they were

wearing dark gloves. The SEM is much more definitive than what we do now. That is really the only area that we are lacking, and we are working on getting grant money in order to get one.

We would also like to expand DNA. We have already proven that our instruments, our people, our methods and our facility all work correctly for DNA — it has gone to the Supreme Court and been proven. If we add DNA testing to another lab, we have to prove every instrument, every analyst, every method and the location all work and it takes about two years to do that. DNA is one area that you absolutely have to follow everything to the letter, you cannot vary from any step at all. It is just one of the disciplines that we fear what we call drift. If we did put DNA at another laboratory, it would have to be one that was close enough that the two sections would be comparing, combining and checking on each other constantly. The hope is that we eventually can get some new space here in Frankfort and shove DNA around here a little bit more, and maybe add to its potential so it is a little faster. That is about the only area where we would increase instrumentation and people.

**How long do you foresee it taking to get the money for the Scanning Electron Microscope?**

**LS:** They are extremely expensive, and in these budget years that is part of the problem. We are competing with funds. The Kentucky State Police has a laboratory, but we are a support function to law enforcement — not just to KSP, but to every law enforcement agency in the state. We suck a lot of money out of KSP. Just the general work horse pieces of equipment that we use, the gas chromatographs and the mass spectrometers that process more than 85 percent of our cases — the GCs are \$55,000 a piece and the mass specs are close to \$100,000 a piece. They last approximately 10 years and we have probably 40 of them across the state. We always try to get grants whenever we can to purchase many of those pieces of equipment. Grant money right now is all geared toward DNA. We are hoping there is a grant that the feds are letting up on that we can twist a little and hopefully get the SEM.

**Does the lab offer training for law enforcement officers? If so, in what areas and how would officers get information to register and attend?**

**LS:** We do a lot for our own agency because our theory is, get the detectives trained as much as possible, and they will submit the best possible evidence back. We do 40-hour blood-stain pattern training. We also have, in house, what we call the TTT, the traveling training team, where we will go out regionally to an

agency that wants training. But I hate going to each individual agency to do that because it is a lot of time and we have to take people off the bench. We basically tell them, if you will set up a regional training and invite 50 to 100 officers, we will come up for a day and work with you.

**RA:** Which is a very good thing because it leads back to one of the first questions asked — if the departments know the right things to send, it takes a whole lot off the back log and off the work load.

**Is there any kind of coordination with the Department of Criminal Justice Training for training in evidence submission or other types of coordination for teaching these classes?**

**RA:** I think overall DOCJT offers many evidence-handling classes and, overall, I think they do a good job on that. Actually, we coordinate with them to get some of our people trained and visa versa. So it is a total team effort on DOCJT and the state police to make training as efficient as possible.

**LS:** We are working with them on a class in February to send 20 of our people to go through crime-scene training. DOCJT does a very good job with what it does. They do have a couple of investigative classes and they will come through here and spend two hours. I will lecture the daylight out of them for about half an hour, then walk them through the laboratory and let them ask their general questions because, at that point, it is not really a tour. These are people who actually submit evidence to the lab and they have specific questions.

**RA:** With those 20 people, we are working on a pilot project here at the lab to send our chemists and biologists, out into the field to help with crime scenes. Not all the time do people send bad things, so do not get that wrong, but overall this project may help us get better quality evidence submitted. DOCJT is helping us with getting the training we need to make this available. We are starting the pilot project with the state police to see how it goes, and hopefully we can open it up to the rest of the depart- >>



▲ The rifling inside a gun barrel (like above) spins the bullet as it speeds down the barrel, for accuracy and stability. Each manufacturer, has their own specifications, which rarely change, allowing analysts in the labs' firearms sections to use these general rifling characteristics to match bullets to guns.

“ If we know that officers are helping us with our back log, we tend to establish a better relationship with them. ”

cases from around the state – and they do it pretty well. It use to be that we were really back logged, but they have really gotten a grip on it and they are processing cases quite quickly now.

At one point, we had a firearms analyst in London and one in Madisonville and it did not really help speed things up. By consolidating them, they are able to better provide a second opinion or do peer review, since everything has to be checked. Instead of having one analyst in various places, we were able to put two or three of them together and it actually helped make the



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single protocol correctly and is their interpretation correct. So, it takes about two months to get it in and get it working.

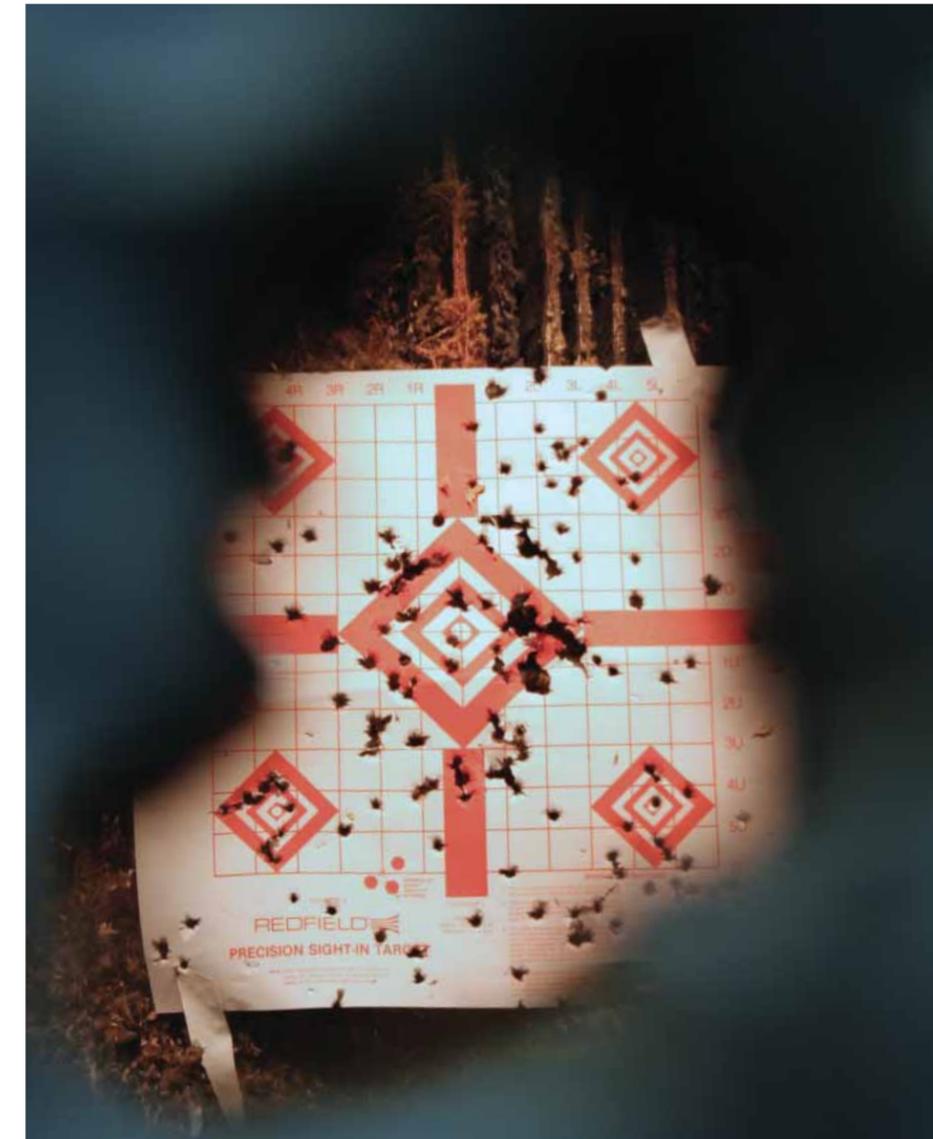
Our analysts really care. And actually they are getting to use overtime right now because they are so backlogged. They go home every night knowing that all these cases are not worked — it weighs on them that there are people sitting in jail waiting on them or victims waiting for an answer and for justice in the court system. They also know innocent people are sitting in jail that hopefully can be exonerated and they carry that with them everywhere.

**RA:** The lab employees do a great job because when you are talking about six labs spread throughout the commonwealth and staying on the same page all the time with everything, that can be a difficult thing and they do a good job.

**LS:** And with salaries, they could come out of college with a chemistry degree or biology degree and step into other industries and make a lot more money, but they do it because they like the forensics. They do it for the satisfaction. Whether they have just got somebody that has been in jail for 10 years out because he is not the one that did it or if they saved someone who would have gone to jail for 100 years, or if they literally have helped catch this really bad guy — that gives them satisfaction.

A lot of people say that we are not objective or we are prosecution based, but we are not. We fall under a law enforcement agency but that is because they are the ones that need the information in order to investigate and prosecute. But they are not our customers. The jury, the judge, the persons accused and the victims or the families are the ones that we serve. And by being as objective as we can and providing the best analysis, we give officers the tools they need to investigate and the prosecutors the information they need to prosecute and get justice. It is up to the juries to make good decisions and judges to keep it fair. But we help them. That is it. We are a tool, but we are a very objective tool. They do not tell us what the answers will be. J

▼ The Firearms Section of the Central Lab has a firing range within the lab where they can fire ammunition if needed during an investigation. They also have a water tank to fire bullets into when trying to get a standard for a case.



▲ A DNA analyst does a test for blood. The process is called Phenolphthalein, and in the presence of blood, the Q-tip will turn bright pink.

▼  
ments in the state to use our lab members to help process a scene.

**LS:** Assist.

**RA:** Assist underlined three times. Assist while you are out there. Actually, it is more or less a guidance offering.

**How much time is put into training the analysts?**

**LS:** Because of the constant changes that go on in every discipline, we try to send analysts to training once a year whether it is on an instrument process or if it is just general knowledge. We try to send everybody for 40-hour training once per year. We use one grant completely to do that so we are not using any state funds on it. It eats up the grant money and sometimes we do not have enough to send everybody, but it helps a lot. We do not send the entire section to one training. We will send a couple to this and then

have them come back and teach. So between the 40-hour week and then what we interact and teach with each other, that is about another two 40-hour periods throughout the year.

**What is the reality of the process and time line for analyzing DNA or other trace evidence?**

**RA:** Eight months for the most part.

**LS:** That is homicides, assaults and sexual assaults. Your burglaries and your other, lesser offenses are taking closer to a year to get out.

That timeline includes the working time. If the analysts pulled a typical sexual assault case and worked it, it could take about 30 to 45 days analytically, then you have the review process. Their review process is absolutely intense, because they cannot make a mistake on that. It goes through three different hands to review data — did they follow every