

WHAT'S NEWS @ HFSC

HOUSTON FORENSIC SCIENCE CENTER • JULY 2019

HFSC ROLLS OUT DNA MIXTURE INTERPRETATION SOFTWARE

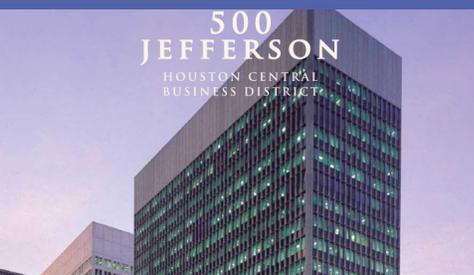
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The Houston Forensic Science Center is rolling out a DNA mixture interpretation software that allows analysts to better use available

data but requires stakeholders to be trained to understand the new information they will be receiving and its limitations. DNA mixtures — meaning samples that have more than one person's DNA present — are complex to interpret and have created some of the biggest dilemmas for crime labs.

The new software, called STRmix, allows staff to analyze more of the mixture data because STRmix uses computer algorithms to do some of the high-level math required for accurate interpretation.

Analysts are currently undergoing training and the first group should be able to use the software in casework by October.

"STRmix breaks apart DNA data in a way that humans are unable to do, opening the door for crime labs like HFSC to make better use of information that we could always see but couldn't necessarily fully interpret," said Robin Guidry, HFSC's DNA technical lead.

"Imagine that until now we knew there were craters on the moon, we could see the outline of the craters, but we couldn't see the detailed interior. STRmix acts like a giant telescope allowing us to see the details of those craters."

The software interprets the data after accounting for a variety of circumstances, including degradation and the potential loss of data. As a result, the final statistic is more significant than what people can do without the software because they are unable to perform the complicated math necessary to account for all the data.

But, while STRmix is a powerful tool which could allow analysts to interpret information that once was out of their reach, it also means stakeholders will be receiving data they never had before. It is crucial for investigators and attorneys — both prosecution and defense — to understand the information presented to them to ensure it is properly used.

"When you suddenly use a powerful microscope to look at crevices you only had a blurry view of before you must ensure the information is not misused, mischaracterized or overstated," said Dr. Peter Stout, HFSC's CEO and president.

"Although our understanding of DNA is constantly improving, along with the technologies and softwares used in analysis, there are still significant limitations. While we can say an individual's DNA is present, we can't say why or how it got there. As we use technologies and softwares that allow us to interpret more mixtures we have to be even more mindful of this limitation," Dr. Stout added.



A Few Words From Our PRESIDENT

HOUSTON FORENSIC SCIENCE CENTER

Peter Stout, PH.D.
CEO/President

Forensic testing and capabilities improve constantly. We know more. We have better technologies that can get at more information. We understand the information in front of us in ways we did not previously.

And yet, this is not magic.

There is probably always going to be more that we DON'T know in science than what we know or think we know.

Forensic testing has real limitations, and those barriers are just as important as our capabilities.

As the crime laboratory that provides forensic services to the Houston Police Department, we have an obligation and a responsibility to ensure the limitations are known. When necessary we have to roll back information if it appears it will or could be misused.

We are reminded daily of this obligation, whether it's as we roll out new DNA mixture interpretation software and have to ensure stakeholders understand the new information in front of them or when the legislature changes the meaning of marijuana and we need to tell people "we just can't answer the question right now."

If we don't do this, the potential is too great for information to be mischaracterized, overstated, understated or ignored.

The result can be a wrongful conviction or a criminal getting let off.

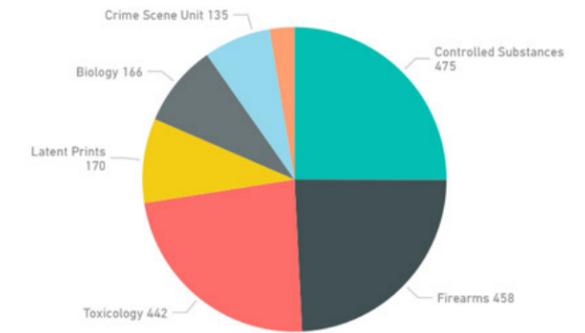
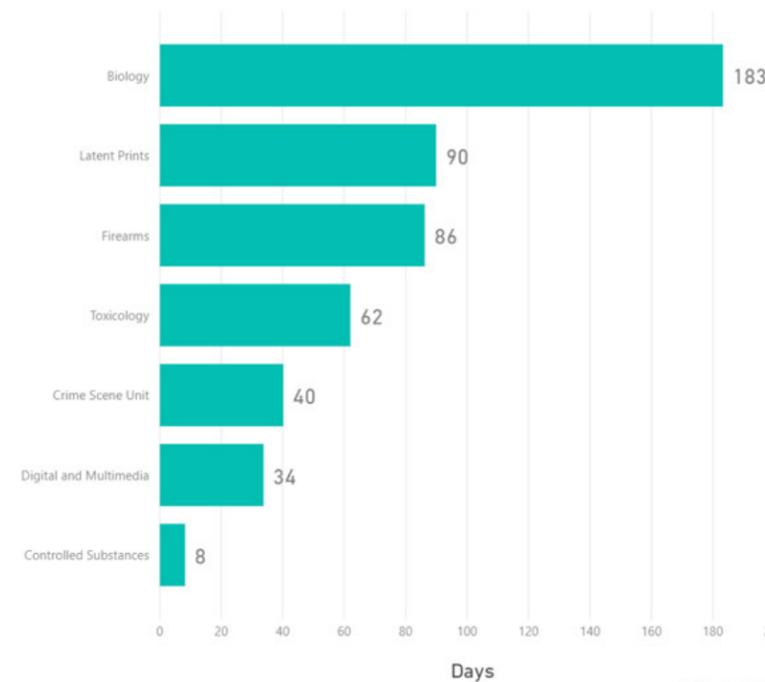
So it's our job not only to provide the right answer, but also to ensure it is used the right way.

Peter Stout, PH.D.
CEO/President

HFSC At A Glance

Requests Completed by Section

Average Turnaround Time for June 2019

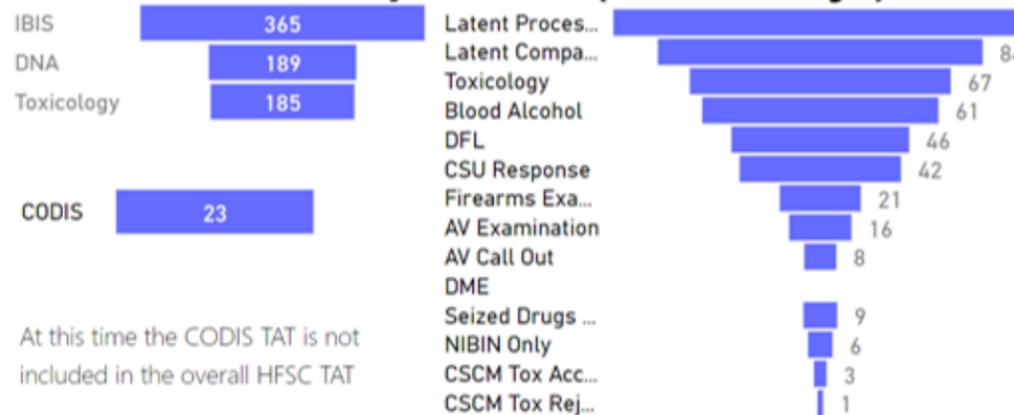


This data is current as of 6/28/2019.

HFSC Request Turnaround Time



Section Request TAT (Past 30 Days)



At this time the CODIS TAT is not included in the overall HFSC TAT

The Houston Forensic Science Center is focused on its upcoming facility move, a complex operation that will impact turnaround times and backlogs for months to come.

Along with still rising requests for service, the upcoming facility move is already impacting production as can be seen from the average June turnaround time, which rose to about 65 days from about 40.

For more information, please visit www.houstonforensicscience.org

LEGISLATIVE CHANGES: HB 1325

HEMP VS MARIJUANA

The Texas State Legislature, following in the footsteps of the federal government, moved in the 2019 session to legalize hemp production, legislation that can provide a significant economic boon to the state, especially to its farmers.

In the process, however, the legislature also changed the definition of marijuana, making it impossible for any public crime laboratory in the state to differentiate between hemp and marijuana. As a result, district attorneys have dismissed hundreds of cases and put others on the backburner until analysis can be completed.

"The intention of the law is good: to legalize and create a framework to regulate an agricultural product that has a variety of uses," said Dr. Peter Stout, HFSC's CEO and president.

"Unfortunately, the manner in which this has been done across the country, both on the federal and the state level, has created a circumstance where crime laboratories are unable to currently do the analysis required

for marijuana prosecutions to move forward."

Hemp and marijuana are botanically the same plant, *cannabis sativa L.* Until now, crime laboratories knew to strip the leaves and flowers _ the "marijuana" _ from the stalk, or the "hemp," to do testing that would tell investigators if in fact the seized plant material was marijuana.

The testing, too, typically took only minutes. First, an analyst would look under the microscope to identify hairs unique to the cannabis plant. Then

"IT WILL TAKE US TIME TO CATCH UP," DR. PETER STOUT, HFSC'S CEO AND PRESIDENT

they would conduct a chemical spot test that indicated whether cannabinoids or the group of related molecules that includes THC, the chemical in marijuana that causes the "high," was present.

That testing, however, is no longer sufficient.

The new law defines marijuana as anything with a THC concentration of 0.3 percent or higher. Anything with a concentration lower than 0.3 percent is hemp.

In Texas, the law went into effect the moment the governor signed it on June 10.

"The crime labs, however, were

not given the time nor the money to prepare for the change in the law, which now requires extensive quantitative analysis that could take hours instead of the minutes it previously took to complete marijuana testing," Dr. Stout said.

Since most crime labs in Texas never had a need to do such quantitative analysis, most do not have the methods in place to conduct the testing. In addition, analysts may not be trained to do the more in-depth analysis. And in some cases, the lab may not be accredited to perform the work or have the necessary instrumentation.

The labs in Texas believe they have found a three-step testing method using existing instruments, but it will take about six months for them to validate and train staff. And the method can only be used to analyze plant materials.

Edibles, oils and other materials derived from the cannabis plant requires more precise quantitative analysis and it could be several years before labs have the funds to purchase the necessary instruments and the time to train staff on the methods.

"There is a solution for all of this, unfortunately though, we can't do it overnight and the law went into effect immediately," Dr. Stout said. "We understand the frustration of police and prosecutors scrambling to continue enforcing marijuana laws, but it will take us time to catch up."

HOUSTON FORENSIC SCIENCE CENTER Blood vial recall jeopardizes drunk driving cases



Manufacturer recalls gray-topped tubes used in blood alcohol testing



The missing preservative stabilizes blood alcohol concentration and prevents clotting



BD, the manufacturer of gray-topped vials used to collect blood samples for alcohol and drug analysis, has recalled more than 200,000 tubes, jeopardizing thousands of suspected impaired driving cases.

The manufacturer said in its recall notice, released on June 12, that "a small portion of this lot has been confirmed to have no additive within the tube."

The additive or preservative helps prevent clotting and stabilizes the alcohol concentration in the blood after it is drawn.

The Harris County District Attorney's Office said it is reviewing thousands of cases it believes may have been impacted by the recall.

BD has said that only about 100 of the vials do not have the necessary preservative. However, the company said it began distributing vials from the affected lot in August 2018 and does not know who received the additive-free tubes.

"It is that unknown that makes this difficult to deal with," explained Dr. Peter Stout, HFSC's CEO and president.

Proper protocol for those drawing the blood is to check

the tube in advance to ensure the preservative _ which appears as a powder at the bottom of the vial _ is there. But there is no guarantee that happens and once the vial is full there is no way of telling whether the preservative was there to begin with.

Most research indicates that absent the preservative blood alcohol levels will decrease over time. However, there are specific, highly improbable conditions in which the body can create alcohol and the concentration will increase.

"The problem is no one can say how unlikely it is for that to occur, only that it is extremely rare," Dr. Stout said.

HFSC has about 2,000 kits _ each with three tubes _ from the affected lot that remain either in distribution among law enforcement or that have already been used.

"We are doing the best we can to call back those kits but the best guess is that they will continue to pop up for months, if not years," said Dr. Stout.

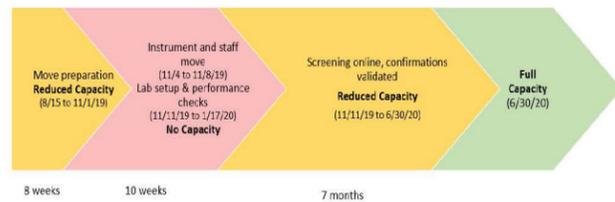
The Texas Forensic Science Commission issued a memo for stakeholders in the state. The memo can be read here.



THE BIG MOVE LAB IMPACTS

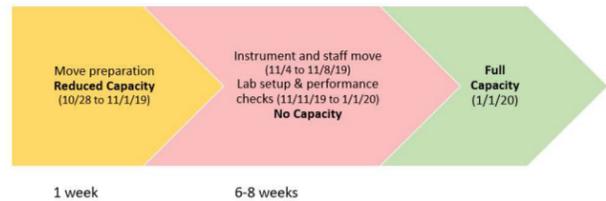
By Jordan Benton

Toxicology: Drugs



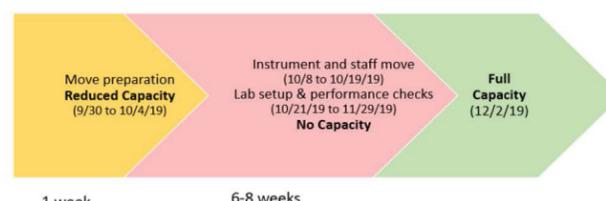
HFSC is outsourcing drug confirmations. This will continue until new instruments (LC-QQQ) are validated, projected to be completed 6/30/20

Toxicology: Blood Alcohol



Projected section will be back to normal operations by April 1, 2020

Forensic Biology



HFSC will outsource sexual assault kits while lab is at no capacity. Projected section will be fully operational on non-sexual assault kits by January 1, 2020

The Houston Forensic Science Center is about 18 weeks away from completing its final and most complex move to 500 Jefferson: the lab.

Before, during and after the move each section will lose some operational capability and will have to catch up on the back end.

The length of time the discipline is out of production and how long it takes them to get back to their current turnaround time will vary depending on how long it takes to revalidate instruments and on how many requests they get during the shutdown.

Temporary shutdowns will largely be in October and November when the labs are in the midst of the move.

Each section will also adhere to quality and accreditation standards during the moves and the plans account for those needs as well.

For now, the immediate focus remains on completing construction on the 18th floor, where the lab area will be, and the basement, where firearms will have a shooting range and the crime scene unit will process

evidence.

The 18th floor lab furniture will be delivered in August and installed in September. Instruments will be moved between mid-October and early November.

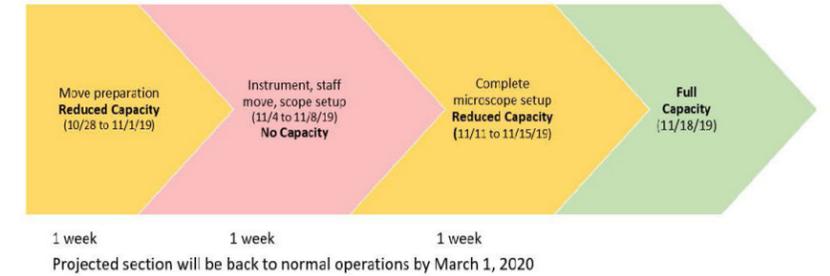
Each forensic discipline faces its own move challenges. In toxicology, for example, the lab equipment is old and more sensitive, making it more difficult to reliably move instruments. In nearly all instances, it does not pay to move toxicology's aging instruments, and instead new items are being bought and will be validated in the new lab.

Staff will run performance checks before and after the moves to ensure the instruments behave as expected and methods respond the same after the move as they did before.

The firearms section's National Integrated Ballistics Information Network (NIBIN) will also move and setup in October/November.

Rush cases will be handled through the move and information will be provided to stakeholders on who to contact in the event of an emergency.

Firearms



Latent Print Processing



Seized Drugs



The Houston Forensic Science Center's laboratories are preparing for the complex move to its new facility later this year. Each section will shutdown operations for some time depending on the length of time it takes to validate instruments and methods. HFSC must maintain its high quality standards throughout the move and adhere to all accreditation requirements, so both are being considered during the planning stage. It is crucial for stakeholders to understand the timeline of events so they can prepare.

TRAINING CSIS USING GLOW STICKS

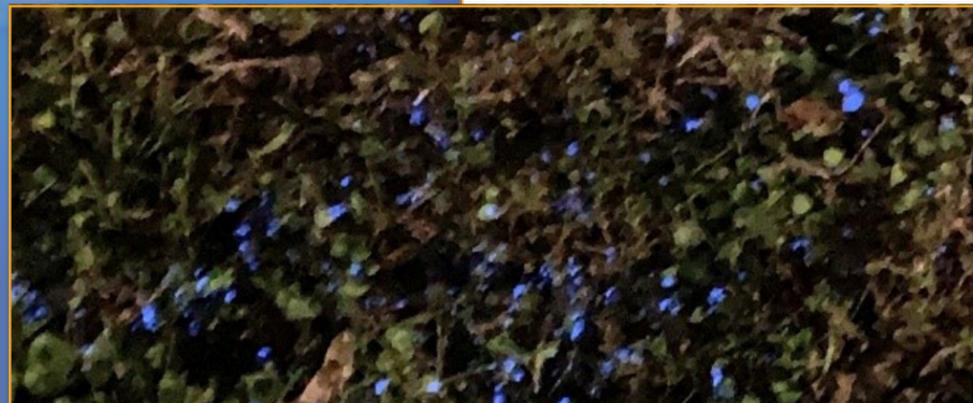
By Mike Fulton, crime scene supervisor and forensic photographer



BlueStar creates a chemical reaction that allows CSIs to visualize bloodstains



Glow sticks can be used to train CSIs to use BlueStar



Glow sticks spread across a grassy surface for training

The Houston Forensic Science Center has been using a cheap, readily available item to teach its crime scene investigators how to use a tool designed to help them identify blood that is not visible to the naked eye: glow sticks.

BlueStar is a luminescent agent crime scene investigators use to identify blood that may not be visible to the naked eye. BlueStar creates a chemical reaction with blood, making it glow and thus visible.

However, luminol performs best in a dark environment creating a challenge for CSIs who need to capture the image in a picture. This is a difficult technique for a photographer to master and creates a budgetary concern during training as BlueStar

is expensive and cannot be wasted on trial and error.

And so, the perfect training solution is to use the incredibly popular and cheap, glow sticks. Yes, the same glow sticks used for birthday parties, nighttime outdoor activities and holiday events. The same glow sticks that are sold just about everywhere!

Glow sticks are not only cheap, but fun, removing some of the stress associated with crime scene photography and the risk of ruining real evidence during training.

The blue glow stick has about the same “glow” as the reaction that BlueStar has when it encounters blood. In addition, BlueStar’s luminescence only lasts a few seconds, further increasing

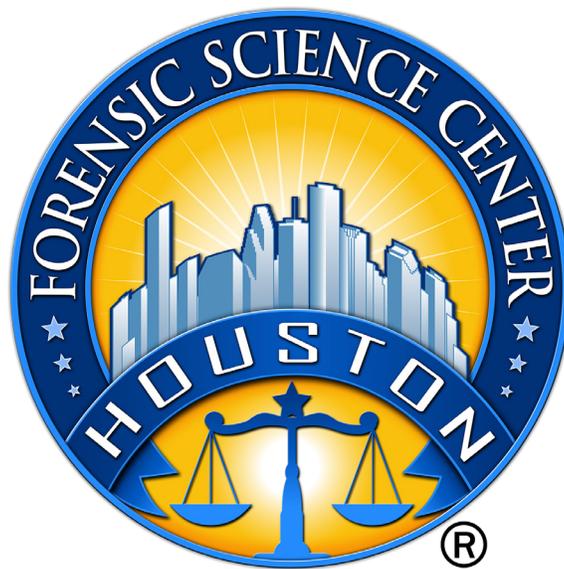
the challenge of using it in training. But a glow stick can be cut open and spattered on a surface area after it has glowed for 10-20 minutes.

Cracking the glow stick open and letting it run for some time allows the luminescence to last longer after it is spread on a surface. The best part is this can be

done many times, at almost no expense and without damaging an actual crime scene.

A word of warning: glow sticks that have been cut open can sting and burn the eyes, and irritate the skin, mouth and throat. Use personal protection gear when cutting and spreading the chemical inside.





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