



Agilent case study

Guilty or Not Guilty?

Agilent Helps Forensic Toxicology Laboratory Analyze the Evidence

For Charline Bottinelli, accuracy is essential

She analyzes samples for a forensic toxicology laboratory, LAT LUMTOX, in Lyon, France. The results she gets are often presented in court and may determine a person's guilt or innocence.

That's why Bottinelli uses at least two different technologies to test the various samples—blood, urine, saliva, bile, bone marrow—that come to her lab from the Department of Justice. Many of the samples are taken from people who are suspected of driving under the influence of drugs, others are postmortem samples in cases of unexplained deaths.

"We are confident in our results because we have good equipment," she explains, "and we have developed methods that compare results from different technologies such as LC/MS and GC/MS."

Most of that equipment comes from Agilent, including GC/MS, GC/MS/MS, GC/Q-TOF, LC/MS, and GC/FID systems.

Of matrices and methods

Bottinelli describes her lab's years-long relationship with Agilent as friendly and interesting.

"In our production, the biggest challenge is on alternative matrices, such as bile and bone marrow, and to find various narcotics or drugs of abuse in these matrices," she says. "Agilent helps us with technologies such as the 7250 GC/Q-TOF."

The 7250 delivers full-spectrum, high-resolution, accurate-mass data with a wide dynamic range for identifying and quantifying GC-amenable compounds.



Charline Bottinelli

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"With this instrument," Bottinelli says, "we can identify unknowns, such as new psychoactive ingredients [found in so-called designer drugs, formulated to get around existing definitions of illicit compounds]. We can't do that with other instruments in the lab."

What's more, she says, "If we have a problem developing another method for a specific drug or molecular compound, we have always someone from Agilent to help us."

Less cleaning, more analyzing

Bottinelli also singles out the Agilent JetClean self-cleaning ion source, a technology her lab beta tested. Indeed, LAT LUMTOX was the first lab to use JetClean for forensic applications and collaborated with Agilent to set up the method.

The samples that LAT LUMTOX analyzes can be very dirty, even with a multiplex fraction procedure as a purification step.

JetClean is designed to keep Agilent gas chromatography/mass spectrometry systems free of matrix deposits that would otherwise build up over time and degrade instrument performance. Using a carefully controlled hydrogen flow, JetClean technology greatly reduces the need for source cleaning on Agilent single and triple quadrupole GC/MS systems.

"We've had the JetClean on our GC/MS for four years, and for this installation we can say that we clean the source only three times a year. Before, we cleaned it six to eight times a year," she says.

Preventive action

Bottinelli is careful to point out that her team also installed Agilent backflush technology at the same time and must attribute the improvement to both, saying, "the two technologies are very important and good for us."

Backflush reverses the column flow in a GC system after the last compound of interest has eluted, removing high-boiling components. The benefits include longer column life, quicker GC maintenance, decreased sample preparation time, and less mass spectrometry maintenance.

While her team has not quantified the resulting savings in terms of cost, Bottinelli says, "the real impact is on the number of times we clean the source."

In fact, she notes, even the three cleanings they do now are not because the ion source is dirty.

"It's a preventive action," Bottinelli says. "Before, we did that because it was necessary."



Learn more about the JetClean self-cleaning ion source:
www.agilent.com/chem/jetclean

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