

Fingerprints reveal if you've had coffee, cocaine or cancer

A police force is testing a new fingerprint scanner that can use traces of caffeine, cosmetics and a range of illegal drugs to build a “chemical biography” of a suspect from a crime scene.

The Home Office-funded device, which is also said to be able to identify gender and even whether a suspect has cancer, can flag up signs of cocaine, heroin or cannabis use within a minute. It is being tested by West Yorkshire police in real investigations.

Simona Francese, a chemist at Sheffield Hallam University who has played a leading role in developing the fingerprint reader, said that she expected that the evidence it provided would soon be used in a trial, although it will be at least two years before the final results of the tests are published.

“I am told that, in our testing of our protocols on crime scene marks, should we retrieve useful information they will be using it for steering their investigations,” she said. “Should the case be discussed in court, I will be called as an expert witness even if the technology has not been validated. It will all depend on how strongly, robustly and transparently I can defend our analyses.”

The device fires a laser at the fingerprint, which is coated with a chemical, known as a matrix. Under the beam, the substances emit charged particles that can be detected in seconds, although pinpointing where in the fingerprint they were found can take up to an hour.

It has already been shown that the scanner can detect tiny traces of cocaine, caffeine and cleaning products. In a study published in the journal *Scientific Reports* this week, Dr Francese and her colleagues at the Home Office and Netherlands Forensic Institute demonstrated that it could also pick up a wide range of other drugs.

Depending on the substance, Dr Francese said that fingerprints could be read days or weeks after being left at a scene. “Building a chemical biography is the purpose of this research. It takes time to build a vast array of the chemicals it is possible to detect, but we are getting there. The data on caffeine suggests that we could hope for diet to be picked up — at least to tell the difference between vegetarians and meat-eaters.”

She added: “We can say a lot about a variety of substances the suspect has come in contact with — even condom lubricants from a rape scene — and, in laboratory settings, we can say if the suspect is a male or a female with 85 per cent confidence. We have started to detect medications which contribute to the profile of the suspect, and we have detected proteins associated with some types of tumours in fingermarks.”