

First large scale study of cocaine users leads to breakthrough in drug testing

September 22 2017



A pile of cocaine hydrochloride. Credit: DEA Drug Enforcement Agency, public domain

Scientists from the University of Surrey have developed a rapid and highly sensitive fingerprint test that can take just seconds to confirm whether someone has used cocaine.

This new breakthrough, published in *Clinical Chemistry*, comes as a result of the first large scale study of cocaine users and could pave the way for the detection of a range of other Class A substances.

The research was carried out with partners from the Netherlands Forensic Institute and Intelligent Fingerprinting.

The team, led by Dr Catia Costa and Dr Melanie Bailey from the University of Surrey, developed a new technique to analyse the levels of cocaine detected in the fingerprints. They used chromatography paper to take the sample as part of a technique known as paper spray mass spectrometry.

The study involved taking fingerprints from a group of patients seeking treatment at [drug](#) rehabilitation centres, as well as a larger group not known to be drug users. All of those taking part washed their hands before the test in a variety of ways, and then samples were collected on the prepared chromatography paper. The fingerprint is developed using chemicals, so that the ridges of the fingerprint (and therefore the identity of the donor) can be established prior to analysis. When someone has taken cocaine, they excrete traces of benzoylecgonine and methylecgonine as they metabolise the drug, and these chemical indicators are present in fingerprint residue. Importantly, the traces can still be detected even after handwashing.

According to the National Statistics Office, 1 in 12 adults aged 16 to 59 (around 2.7 million people) had taken illicit drugs in 2015/16. There were also over 8,500 people who were admitted to hospital after being diagnosed with drug-related mental health and behavioural disorder. In 2015, there were almost 2,500 deaths related to drug misuse - an increase of 10 per cent on 2014.

Dr Costa said: "Paper spray mass spectrometry is gaining increasing

popularity in forensic circles because it is incredibly sensitive and is very easy to set up a testing system - the units will save laboratories time.

"This is the first time it has ever been used to detect the presence of drugs in fingerprints, and our results show the technique was 99% effective in detecting cocaine use among the patients."

Dr Bailey said: "This is a real breakthrough in our work to bring a real time, non-invasive drug-testing method to the market that will provide a definitive result in a matter of minutes - we are already working on a 30 second method."

"And, as with previous methods we have developed, it is non-invasive, hygienic and can't be faked - by the nature of the test, the identity of the subject, and their drug use, is all captured within the sample itself."

"This exciting research clearly demonstrates the important role that fingerprints can play in simplifying drug screening, and complements our own parallel developments in portable, point-of-use diagnostic tests. These activities confirm the value of a fingerprint as a diagnostic matrix," added Dr Jerry Walker, Intelligent Fingerprinting's CEO.

"We have supported the University of Surrey research programmes for the last four years, and Dr Bailey and her team have shown time and again that they are the world's leading group in fingerprint diagnostics research using mass spectrometry. We congratulate them in continuing to expand knowledge in the revolutionary field of fingerprint-based diagnostics."

It is anticipated that this technology could see the introduction of drug tests for law enforcement agencies to use within the next decade. Drug testing is used routinely by probation services, prisons, courts and other [law enforcement agencies](#). However, traditional testing methods have

limitations. Where bodily fluids are tested, there can be biological hazards and often a requirement for particular storage and disposal methods.

Provided by University of Surrey

Citation: First large scale study of cocaine users leads to breakthrough in drug testing (2017, September 22) retrieved 19 April 2024 from <https://phys.org/news/2017-09-large-scale-cocaine-users-breakthrough.html>

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