

Researchers work with dogs to sniff out chemicals that identify human remains

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Jonathon Brooks in the lab. Credit: University of Leicester

Researchers from the University of Leicester are working with police forces in the UK to improve the accuracy of police dogs in identifying human remains in criminal investigations.

The research, led by PhD student Jonathon Brooks from the University of Leicester's Department of Chemistry, looks at the chemical aspects of decomposition, investigating the [volatile organic compounds](#) (VOCs) given off when biological matter decomposes.

The team hopes to establish what chemicals the [dogs](#) are detecting and whether it is just the one compound or combinations of these compounds.

They are then working with professionals to use these substances to train victim recovery police dogs to locate [human remains](#).

The researchers have shown that while different tissue types decompose at different rates they share similar VOC profiles. However, the environment that the tissue is exposed to can significantly change this VOC profile - suggesting that the samples that are often being used by police forces aren't fully representative of buried human remains.

The team is using a variety of analytical techniques to characterise and measure the substances released by decomposing tissue, working with police officers to train their recovery dogs to recognise these different compounds.

Jonathon explained: "As human remains break down, these small molecules are released into the surrounding environment, many of which can be detected by dogs.



Jonathon Brooks working with dogs. Credit: University of Leicester

"Depending on the conditions, different compounds will be released, so police search dogs need to be able to recognise a vast array of molecules."

The team is currently supporting cadaver dog training within the UK, as police forces are often very limited to which samples they are able to use, which can reduce their effectiveness during investigations.

The researchers are working closely with University Hospitals of Leicester and multiple police forces across the country, to establish how the data can be used in [criminal investigations](#) in the future.

The University of Leicester project is the only research within the UK to apply multidimensional chromatography – which improves the ability to separate complex chemical mixtures - to the understanding of decomposition, in collaboration with laboratories in Australia (UTS; University Technology Sydney) and Belgium (University of Liege).

Jonathon added: "Within the UK we are restricted to the use of animal samples in both research and [police](#) dog training, due to current legislation.

"Our Australian collaborators more recently opened a human decomposition facility. Having visited both the site and the laboratory we have been able to advance our knowledge on the analytical instrument and are looking to apply this to both our singular organ and whole mammal research.

"Currently protocols are being introduced to allow [police forces](#) to use

donated human samples from hospitals, to increase the reliability and effectiveness of the dog's ability to detect such remains. However this is yet to be implemented, and the regularity and consistency of the human tissue supply is as yet unknown."

Professor Paul Monks, Pro-Vice-Chancellor and Head of the College of Science and Engineering at the University of Leicester, who supervises Jonathon's research, said: "Jonathon is really showing how university-led discovery science can be rapidly translated and inform forensic science practice. Jonathon is fusing state of the art analytical science with user-led problems. It is clear that Jonathon has a nose for success."

Provided by University of Leicester

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