

# Improving dogs' ability to detect explosives

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This image shows an improvised explosive device (IED) detection dog, sniffing out a possible IED. Credit: Defense Video and Imagery Distribution System

Training of dogs to recognise explosives could be quicker and more effective following research by animal behaviour experts.

The Office of Naval Research (ONR) in the US has enlisted the expertise of academics from the University of Lincoln, UK, to improve the training of search [dogs](#).

Explosive search dogs are usually trained to alert handlers to specific [odours](#), learning each scent individually.

This is a time-consuming process, especially as the composition of different explosives varies greatly. Helen Zulch, Anna Wilkinson and Ruth Croxton, from the School of Life Sciences at Lincoln, have been awarded a grant from the ONR to investigate whether explosive detection dogs are capable of learning by categorisation, a [cognitive process](#) that is thought to play a major role in the way humans and animals naturally process new information. Nina Cracknell of the Defence Science and Technology Laboratory (DSTL) is a [collaborator](#) on the project.

The study will explore whether dogs can be trained to recognise the significance of a group of odours, rather than having to learn each scent individually.

Helen Zulch, clinical [animal behaviour](#) specialist, said: "There is a need to develop more generic training approaches as current methods are fairly laborious. In this study we will be testing whether a dog can be taught a general rule for a group of odours and then apply that knowledge to a new situation, involving [scents](#) it has never encountered. We know dogs can categorise [visual stimuli](#), so the aim of this study is to find out whether dogs are able to categorise odours in a similar manner."

This proof of principle study will involve teaching dogs to detect a group of accelerants, and if this is successful then future research can move on to explosives.

"One of the main issues with explosives is that, especially in the Theatre of War, more and more homemade devices are being created. It's getting the dogs to quickly understand the relevance of certain new substances without alerting on every household chemical," said Dr Zulch.

In addition the team will be carrying out the analysis of air samples to try and pinpoint what it is the dogs find significant or otherwise.

Dr Zulch said: "The main question we would like to answer is, what are the specific chemical odours the dog is alerting to? If successful this initial research could lead to applications in the real world."

Lisa Albuquerque, Naval Expeditionary Dog Program Manager at ONR, added: "One of the great advantages in doing research at ONR is the ability ONR has to reach out to premier scientists around the world in search of solutions for the hard problems identified by our warfighters. We are able to leverage previous research and real-life experiences, such as the UK's extensive history of using dogs for the detection of homemade explosives, to increase the speed with which we can identify solutions and decrease research costs to the taxpayer. The role of canine cognition in processing complex odours is an important and exciting new research area and the work done by the scientists at the University of Lincoln will potentially support long-term improvements to the ways we train dogs for detection."

Provided by University of Lincoln

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