

New technology detects chemical weapons in seconds

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Scientists at Queen's University Belfast are developing new sensors to detect chemical agents and illegal drugs which will help in the fight against the threat of terrorist attacks.

The devices will use special gel pads to 'swipe' an individual or crime scene to gather a sample which is then analysed by a scanning instrument that can detect the presence of chemicals within seconds. This will allow better, faster decisions to be made in response to terrorist threats.

The scanning instrument will use Raman Spectroscopy which involves shining a [laser](#) beam onto the suspected sample and measuring the energy of light that scatters from it to determine what chemical compound is present. It is so sophisticated it can measure [particles](#) of a miniscule scale making detection faster and more accurate.

Normally this type of [spectroscopy](#) is not sensitive enough to detect low concentrations of chemicals, so here the sample is mixed with nanoscale [silver](#) particles which amplify the signals of compounds allowing even the smallest trace to be detected.

Dr Steven Bell from Queen's University Belfast who is leading the research said:

"Although we are still in the middle of the project we have finished much of the preliminary work and are now at the exciting stage where we put the various strands together to produce the integrated sensor

device. For the future, we hope to be able to capitalise on this research and expand the range of chemicals and drugs which these sensors are able to detect."

It is hoped the new [sensors](#) will also be the basis for developing 'breathalyzer' instruments that could be of particular use for roadside drugs testing in much the same way as the police take breathalyzer samples to detect alcohol.

At present, police officers are only able to use a Field Impairment Test to determine if a person is driving under the influence of drugs. The accuracy of this method has been questioned because of concerns that it is easy to cheat.

To ensure the technology is relevant, senior staff members from FSNI (Forensic Science Northern Ireland) will give significant input into the operational aspects of the technology and give feedback as to how it might be used in practice by the wider user community.

Stan Brown, Chief Executive of FSNI said:

"We consider the work being carried out by researchers at Queen's University extremely important and potentially very useful in driving forward the effectiveness, efficiency and speed of forensic science practice. The combination of leading edge research and hands-on experience of FSNI's practitioners has already proven very fruitful and is likely to lead to significant developments in forensic methodologies across a range of specialisms."

In the future this technology could have a number of important applications and according to Dr Bell: "There are numerous areas, from medical diagnostics to environmental monitoring, where the ability to use simple field tests to detect traces of important indicator compounds

would be invaluable."

Source: Engineering and Physical Sciences Research Council ([news](#) : [web](#))

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