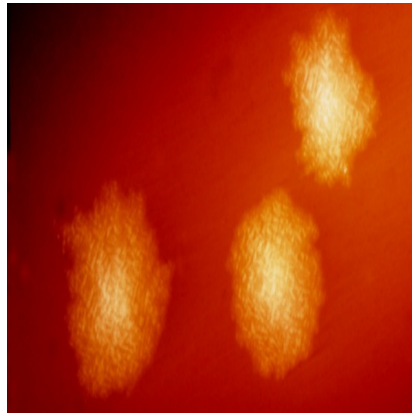




## e-Nose Sniffs Out Superbug C. Diff



A rapid and sensitive electronic nose that sniffs out the highly infectious hospital superbug *C. diff* (*clostridium difficile*) has been developed by scientists at the University of Leicester in the UK, according to a *Medical News Today* report.

*C. diff* is a highly infectious bacterium that causes diarrhoea, stomach cramps and high temperature. The pathogen, which is shed in the faeces of sick patients, can spread in hospitals mainly through the hands of healthcare workers, said the research team composed of chemists and a microbiologist. Their findings were published in the journal *Metabolomics*.

With the use of a spectrometer, the scientists were able to identify the unique chemical fingerprint of *C. diff*, and established the potential for rapid diagnosis. The new method does not only detect the bacterium, the researchers explained, it also identifies the specific strain of *C. diff*.

Different strains of *C. diff* can cause different symptoms and may have to be treated differently, said lead author Paul Monks, a professor in the Department of Chemistry at Leicester. Thus, a test that could identify not just an infection, but what type of infection could lead to new treatment options, he pointed out.

Rapid detection of *C. diff* is important as this will not only reduce infections but also make sure patients receive the appropriate treatment. "Delayed treatment and inappropriate antibiotics not only cause high morbidity and mortality, but also add costs to the healthcare system through lost bed days," Prof. Monks said.

Using the large collection of well-characterised strains of *C. diff* kept in Leicester's Microbiology Department, Monks' team discovered the bacterium emits a total of 69 Volatile Organic Compounds (VOCs), unique combinations of which feature in different strains.

### Study Serves as Proof of Concept

Although the study did not go into the clinical practicalities of using the method (for instance, on stool samples), it has shown that it has potential for delivering rapid and detailed results.

"Our approach may lead to a rapid clinical diagnostic test based on the VOCs released from faecal samples of patients infected with *C. difficile*," Prof. Monks noted. "We do not underestimate the challenges in sampling and attributing *C. difficile* VOCs from faecal samples."

One of the challenges is that the toxin *C. diff* produces degrades at room temperature and may be undetectable

within two hours after collection of a stool specimen, the scientists explained.

The research team is optimistic about the potential of their work. With further research, the team is looking to develop "a reliable and almost instantaneous tool for detecting a particular strain (of *C. diff*), even if present in very small quantities," said co-author Andy Ellis, a physical chemistry professor who heads the Spectroscopy and Dynamics Lab at Leicester.

Source: MedicalNewsToday.com

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