

Rapid infection test in dogs could curb antibiotic resistance

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Scientists have developed a new way to rapidly diagnose bacterial infections in dogs, enabling testing and treatment with appropriate antibiotics on the same day.

The method could eliminate the delays associated with conventional diagnosis, in which a sample has to be cultured for days to identify the bacteria present before the appropriate treatment is prescribed.

It is a significant step towards the appropriate use of antibiotics by limiting the use of inappropriate or a wide spectrum of antibiotics for unidentified infections and preventing lengthy courses of treatment.

The development could also be applied across animal and [human medicine](#), for bacterial and other types of infections, researchers say.

New approach

The team used kits optimized for common [bacterial species](#) to allow them extract all the DNA from a sample without [prior knowledge](#) of which species are present—so-called metagenomic DNA extraction.

They combined this with an existing technology that generates DNA code from samples, known as nanopore sequencing, and a data analysis tool that identifies bacteria according to their DNA fingerprint.

Fast results

This approach allows identification of bacteria in real time, enabling results in a few hours.

The genes identified in the sample also give valuable insight on how the bacteria present are likely to respond to antibiotic treatment, enabling clinicians to prescribe the drug best suited to the infection.

The team tested their system with skin and urinary bacterial infections in dogs, and were able to detect bacteria within five hours.

They were able to identify bacterial species that are difficult to identify with conventional culturing and determine with high sensitivity whether the bacteria present were likely to be resistant to antibiotics.

Wider use

The system is designed to be adaptable for use in various samples and infections across [animal species](#).

In the future it could be useful across a range of animal and human infections, potentially aiding the diagnosis and [treatment](#) of other types of infections caused by viruses and parasites, researchers say. The study is published in *Microbial Genomics*.

"Our method offers a swift way to diagnose bacterial infections and prescribe appropriate antibiotics within hours of patient testing. Following our work with skin and urinary infections in dogs, we are confident that this approach has potential for use across many animal species, and in humans, and has applications in other [infection](#) types. It could play a significant role in enabling responsible use of antimicrobial treatments and limiting antimicrobial resistance," says Dr. Natalie Ring.

More information: Natalie Ring et al, Rapid metagenomic sequencing for diagnosis and antimicrobial sensitivity prediction of canine bacterial infections, *Microbial Genomics* (2023). [DOI: 10.1099/mgen.0.001066](https://doi.org/10.1099/mgen.0.001066)

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