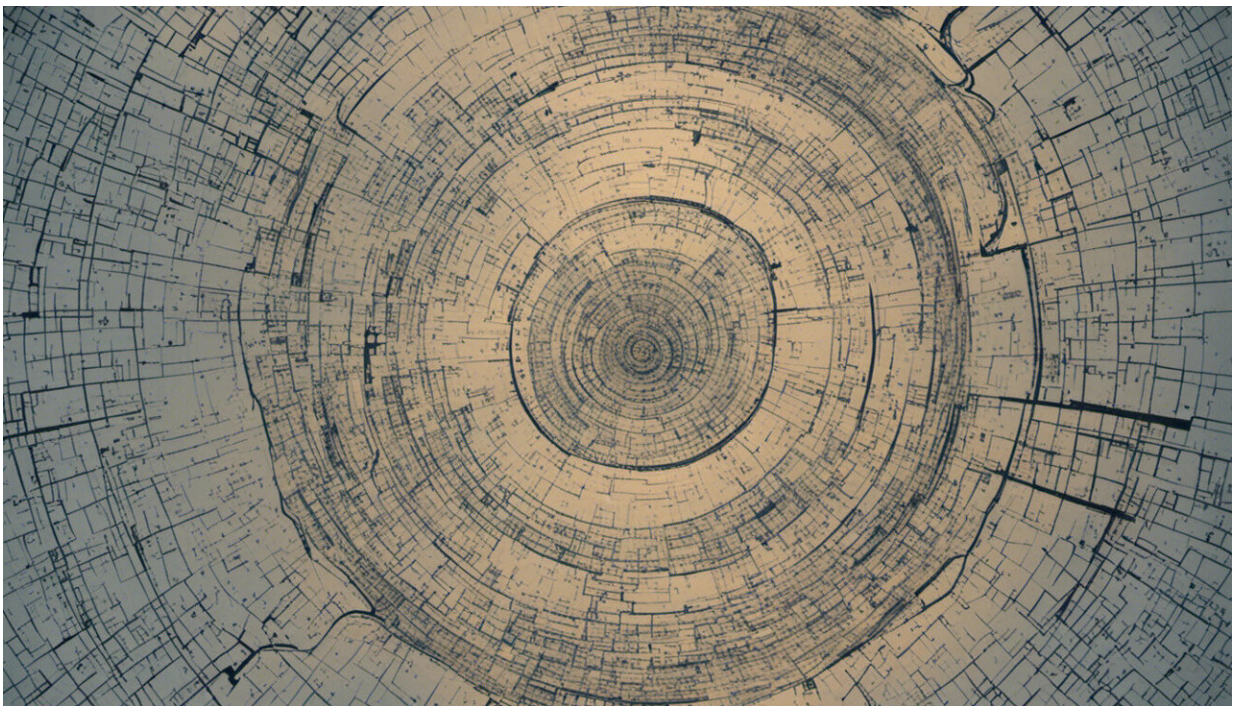


# Microchip that can identify human pathogens in a single test could revolutionize diagnosis of infections

August 14 2013

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Credit: AI-generated image ([disclaimer](#))

Quick diagnosis of an infection is critical to providing early treatment; but, currently, multiple tests can be required to identify the pathogen responsible. Now, Christopher Wong at the A\*STAR Genome Institute Singapore and an international research team have demonstrated that a

recently developed alternative called PathChip can improve diagnoses.

Owing to the lack of a single standard test for detecting all illness-causing pathogens, accurate diagnosis of an infection can be a trial-and-error process. "Doctors order tests to confirm their diagnosis," explains Wong. "If they suspect their patient has dengue fever, they order a dengue test. Often, the result is negative, so they need to order more tests."

PathChip is designed to provide accurate diagnosis of respiratory tract infections in just one test. This tool consists of a chip covered in molecules that can recognize [genetic material](#) from 70,000 different pathogens. By observing which genetic material from a patient sample binds to the PathChip, scientists can immediately identify the pathogens present.

"In this study, we wanted to determine the performance of the PathChip relative to existing methods that are approved by the US Federal Food and Drug Administration (FDA)."

The team extracted genetic material from samples collected from 290 children with [respiratory tract infections](#). Then, they used three methods to identify the pathogens present. Two of these, manufactured by EraGen and Luminex, are FDA-approved methods currently in clinical use. The third was PathChip.

PathChip not only matched the performance of existing tests, but, owing to its wider coverage, it also detected pathogens that the other tests missed entirely. "The PathChip made a diagnosis in 20 per cent more patient samples than the approved methods," Wong explains.

Wong says that PathChip can also cope with the constant evolution of pathogens that changes their genetic make-up and produces new [strains](#).

"Even with [genetic changes](#), we remain able to detect viruses," he says. "For example, the recent Middle East respiratory syndrome coronavirus, and the H7N9 bird flu virus in China, emerged after we manufactured PathChip. However, we could still detect these viruses without modification. With the other methods, new tests have to be designed."

According to Wong, this proven performance means the PathChip has the potential to revolutionize diagnosis in hospitals. "Doctors can order a single test and treat their patients based on the results. This could avoid unnecessary diagnostic tests, shorten hospital stays and reduce antibiotic use."

As the next step towards this, Wong says that he wants to take PathChip into clinical trials.

**More information:** Simões, E. et al. Pathogen chip for respiratory tract infections. *Journal of Clinical Microbiology* 51, 945–953 (2013). [dx.doi.org/10.1128/JCM.02317-12](https://doi.org/10.1128/JCM.02317-12)

Provided by Agency for Science, Technology and Research (A\*STAR), Singapore

Citation: Microchip that can identify human pathogens in a single test could revolutionize diagnosis of infections (2013, August 14) retrieved 26 April 2024 from <https://medicalxpress.com/news/2013-08-microchip-human-pathogens-revolutionize-diagnosis.html>

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