New electrostatic sampler boosts indoor virus detection speed

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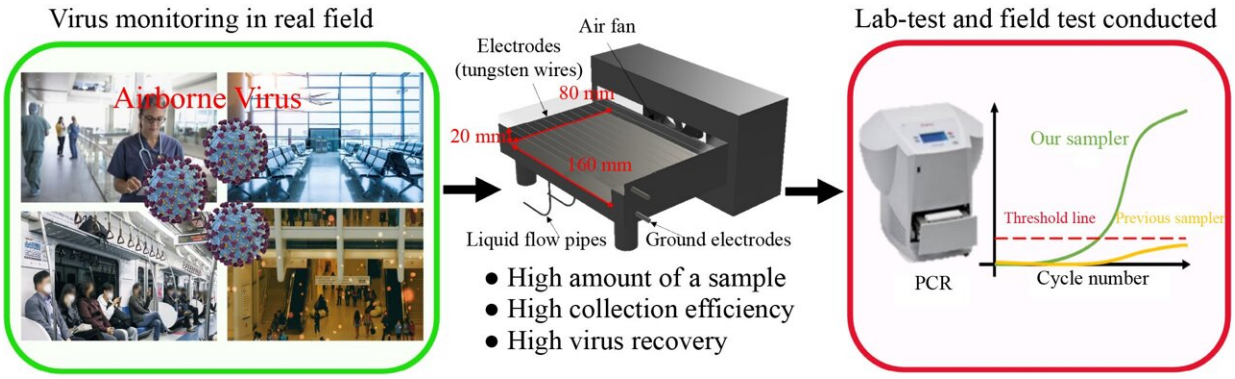

Credit: *Frontiers of Environmental Science & Engineering* (2024). DOI: 10.1007/s11783-024-1845-y

Airborne transmission of viruses, including SARS-CoV-2, has been a focal point for infection prevention in multi-use facilities with dense populations. Traditional air samplers often require long sampling times, increasing the risk of false negatives due to RNA degradation. A newly developed electrostatic sampler addresses this issue by increasing the airflow rate and improving collection efficiency.

Researchers from Yonsei University, in collaboration with the Korea Research Institute of Standards and Science, have developed an electrostatic air sampler that enhances the rapid monitoring of airborne influenza and coronavirus.

The device, capable of high air flow rates, offers significant advancements in detecting viral presence in indoor environments through polymerase chain reaction (PCR) analysis. An article on the research is published in *Frontiers of Environmental Science & Engineering*.

This device is designed to operate at an exceptionally high air flow rate of 250 liters per minute, a significant leap from conventional samplers. Its unique feature is the ability to attract and capture viral particles through an enhanced electrostatic method, ensuring that the integrity of the viral RNA remains intact for reliable PCR analysis.

In practical tests, this innovative sampler has been able to collect and prepare samples for PCR within just 40 minutes, far surpassing the efficiency of existing technologies. The rapid turnaround is crucial in environments such as classrooms, hospitals, and public transportation systems, where timely detection can lead to immediate action, potentially preventing virus spread.

This capability also opens new avenues for continuous monitoring in various settings, providing a continuous assessment of air quality and safety.

More information: Sanggwon An et al, Rapid monitoring of indoor airborne influenza and coronavirus with high air flowrate electrostatic sampling and PCR analysis, *Frontiers of Environmental Science & Engineering* (2024). DOI: 10.1007/s11783-024-1845-y

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