Rapid optical detection system for SARS-CoV-2 and other pathogens

Tech ID: 33235 / UC Case 2021-747-0

BRIEF DESCRIPTION

Researchers at UC Irvine have developed an optical detection system for SARS-CoV-2 and other pathogens that features improvements in screening time, cost, sensitivity, and practicality. As vaccine availability, economic pressure, and mental health considerations has gradually returned society to pre-pandemic activities that require frequent and close interactions, it is imperative that SARS-CoV-2 detection systems remain effective.

SUGGESTED USES

·Detection of SARS-CoV-2 or other pathogens

FEATURES/BENEFITS

·Prevention of SARS-CoV-2 spread.

·Rapid testing time requires only 6 seconds for detection of COVID-19 particles (compared to three minutes for the fastest screening test of viral antigens).

·Remote testing can be performed without human-to-human contact.

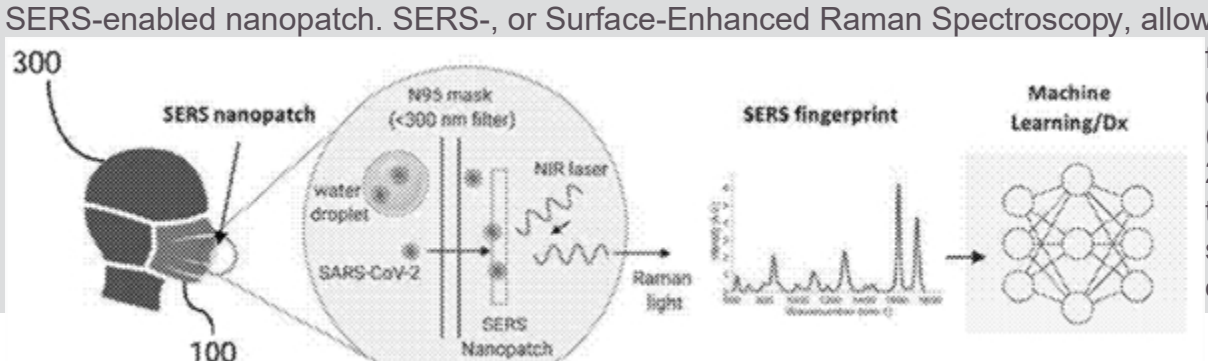
·Cost-effective: savings of up to $400 per 1,000 individuals

·Practical: does not require specimen collection at the time of testing

FULL DESCRIPTION

According to data from the World Health Organization, there have been over one million cumulative COVID-19 deaths in the United States alone. As vaccine availability, economic pressures, and mental health considerations have gradually allowed society to return to pre-pandemic activities, the development of practical and effective SARS-CoV-2 detection systems are of utmost need. Current COVID-19 detection systems (such as molecular diagnostic tests, antigen test, and viral antibody tests) are slow, expensive, lack accuracy, and are uncomfortable for users. As such, there is a need for ultra-rapid, remote (e.g. non-contact), high-throughput detection of SARS-CoV-2 that is user-friendly.

Researchers at UC Irvine have developed a solution that includes (1) an intelligent mask with a SERS-enabled nanopatch and (2) a COBRA kiosk system that allows for the optical detection of SARS-CoV-2 in the SERS-enabled nanopatch. SERS-, or Surface-Enhanced Raman Spectroscopy, allows for the structural fingerprinting of low-concentration analytes (in this case SARS-CoV-2) and greatly enhances the sensitivity of this screening solution (98%; on par with PCR tests).



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INVENTORS

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OTHER INFORMATION

CATEGORIZED AS

» **Biotechnology**
» Health
» **Medical**
» Devices
» Diagnostics
» Disease: Infectious Diseases
» Disease: Respiratory and Pulmonary System
» Screening
» **Sensors & Instrumentation**

The mask-embedded, SERS-enabled nanopatch (see Figure) allows for the continuous collection of user specimen, which can then be analyzed with the AI-powered COBRA kiosk system in just six seconds (compare to 180 seconds of current screening solutions). This novel screening solution will save 38 hours and up to $400 per 1,000 individuals, and it can detect not only SARS-CoV-2, but a host of other airborne pathogens as well. It also does not require human-to-human contact, with users standing in front of the COBRA kiosk and initiating the optical screening themselves. This solution is also practical in the sense that it does not require uncomfortable nasal swabs or saliva-based specimen collection.

» Biosensors

» Medical

RELATED CASES

2021-747-0

STATE OF DEVELOPMENT

In vitro studies with SARS-CoV-2 and other nanoparticles

RELATED MATERIALS

» Capture and detection system for sars-cov-2 and other respiratory pathogens - 06/23/2022

PATENT STATUS

Patent Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

▶ Reducing Risk Of Aerosol-Transmitted Infection From Dental Ultrasonic Instrumentation

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