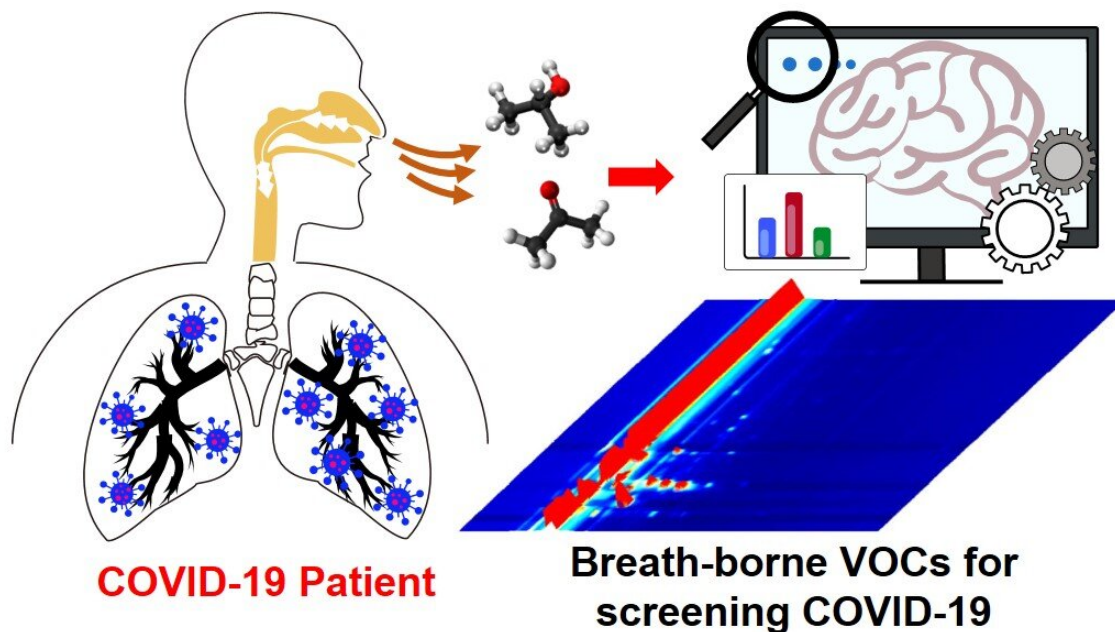


Non-invasive, rapid screening technology for COVID-19 using breath-borne VOC biomarkers

October 25 2021, by Zhou Zixuan



Mechanism of TestBreathNow-TBN. Credit: Peking University

At present, the COVID-19 pandemic is still ongoing in many parts of the world, causing severe socio-economic problems. Therefore, rapid screening for COVID-19 is becoming increasingly crucial. However, existing nucleic acid tests are not time-efficient and carry the risk of

false results, leading to further spread of the virus. Therefore, relying solely on nucleic acid testing poses public health and safety risks, and new detection methods are urgently needed.

Recently, Professor Maosheng Yao from College of Environmental Sciences and Engineering, Peking University, integrated breath sampling, ion mobility spectrometry detection for [gas chromatography](#), and machine learning models to develop a non-invasive exhaled breath screening system for COVID-19 (TestBreathNow-TBN) in collaboration with Chaoyang Center for Disease Control and Prevention and other research partners. The team used the system to analyze breath samples from COVID-19 patients, non-COVID patients with [respiratory diseases](#), and medical staff, and identified 12 key breath-borne VOC biomarkers. The sampling process is completely non-invasive, with subjects using a disposable breathing bag and exhaling for only 30 seconds to complete the sampling process. The system is easy to operate, does not require any testing reagents, and can be used with machine learning models to achieve [rapid screening](#) of COVID-19 patients in 5–10 minutes, with significantly lower costs for a single test.

The system is expected to play a major role in reducing the risk of COVID-19 transmission by providing rapid screening for COVID-19 in situations such as testing for false-negative results, granting permissions to custom entry, and deciding whether to discharge COVID-19 patients from hospitals. This technology will contribute to China's prevention and control of the COVID-19 pandemic.

The results of the study were published as a preprint on June 24, 2020, and were recently published online titled "COVID-19 Screening Using Breath-borne Volatile Organic Compounds" in *Journal of Breath Research*. The new technology is currently applying for a national patent.

More information: Haoxuan Chen et al, COVID-19 screening using

breath-borne volatile organic compounds, *Journal of Breath Research* (2021). [DOI: 10.1088/1752-7163/ac2e57](https://doi.org/10.1088/1752-7163/ac2e57)

Provided by Peking University

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