

New biosensor for the detection of SARS-CoV-2

DESCRIPTION OF INVENTION

The contagion mechanisms of SARS-CoV-2 includes transmission through the inhalation of microdroplets or bioaerosols exhaled directly by patients, especially indoors, as well as through contact with contaminated surfaces. The spread of SARS-CoV-2 by aerosols in indoor environments is becoming increasingly relevant as the main route of transmission of the virus. Evidence from laboratory studies has shown airborne transmission of the COVID-19 virus, which remains infectious for prolonged periods of time. The virus has been detected by PCR in air samples in health centers. Researchers have reported values for SARS-CoV-2 viral load in breath that oscillate in the range 102 to 1011 copies per mL of respiratory fluid.

A new system based on a high-sensitivity mass biosensor has been devised, it continuously monitors signals for the direct detection of SARS-CoV-2 in atmospheric aerosols.

The biosensor is made up of a detector that supports a biofunctionalized chip with one or more specific bioreceptors for the pathogen to be detected. This way, the biosensor linked to a processing module allows triple verification, thanks to the measurement of three parameters, including temperature, and which, through an algorithm, allows the identification and quantification of the pathogen of interest, particularly SARS-CoV-2.

The device allows to assess air quality and the early detection of viruses in indoor spaces such as homes, classrooms, restaurants, cinemas or means of transport. The IDM-UPV biosensor performs direct measurements and also stands out for its ease of use, low cost, minimal maintenance and versatility.

BUSINESS APPLICATIONS

- It can be used in indoor spaces such as homes, classrooms, restaurants, cinemas or means of transport

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

- Continuously monitors signals to detect SARS-CoV-2 in atmospheric aerosols
- The biosensor performs direct measurements either in breath or in ambient air
- It is easy to use, low cost and very versatile since it can be extended to other pathogens present in aerosols.

STATE OF TECHNOLOGY DEVELOPMENT

Preliminary studies have been performed using non-infective virus-like particles (VLPs). The biosensor has been assess at laboratory and hospital scale. It is currently being tested on real samples in different environments such as outpatient clinics, clinical analysis laboratories, and nursing homes, among others. Parallel tests are beginning to be carried out to assess the presence of the virus in air samples in classrooms, and crowded open environments.

INDUSTRIAL PROPERTY RIGHTS

Patent pending: P202130357

Priority Date: 22/04/2021

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