

## Device for capturing and identifying biological organisms in airborne

The CSIC has designed and protected as a utility model an equipment consisting of a filtering device connected to a vacuum pump, that it is capable of capturing airborne biological particles, subsequently allowing complete genomic sequencing of the captured biological organisms, amplifying genomes by gene amplification methods or sequencing DNA and RNA genomes present in viral particles, which are previously purified through the filtering device.

Industrial partners to collaborate through the license of the utility model.

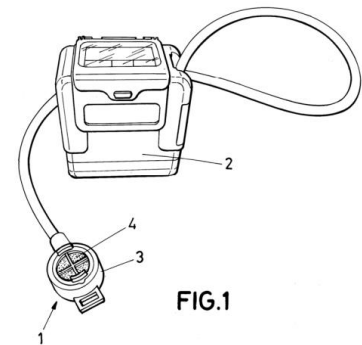
### *An offer for licensing the utility model*

#### Improved method of capture and analysis of airborne pathogens

Air pollution is a major environmental risk to public health as it transports biological particles containing archaea, bacteria, viruses, fungi and pollen grains. The study of airborne biota is relevant for its potential role in the spread of plant, animal and human diseases, with important implications for public health, and a huge economic impact on agricultural and livestock productivity.

Hirst samplers are currently used for this purpose, but their description of the airborne biological community is not complete. They do not allow the purification of viral particles and are expensive and non-portable devices. Polytetrafluoroethylene (PTFE) filters have also been tested, but no efficient analytical method has been proposed to identify all captured biological particles.

The device designed by CSIC researchers provides a suitable method for capturing, detecting and identifying whole biological particles in the air, including viruses (such as SARS-CoV-2) and other pathogens.



Airborne biological particles capturing device.

#### Main innovations and advantages

- This method allows complete genomic sequencing of microorganisms captured on filters, amplification of specific genomes by gene amplification methods, or sequencing of DNA and RNA genomes present in viral particles that have been previously purified.
- Can be used to detect SARS-CoV-2 particles in air samples or MPXV particles (monkeypox virus).
- In a test performed in a COVID-19 room, they showed that the filter substrates of the invention allow to collect and detect SARS-CoV-2 in air by PCR, in a more efficient way, at lower cost and with a lower pressure drop than PTFE filters known.
- The vacuum pump allows to increase or decrease the suction flow through the filtering device.

#### Status

Utility model application filed

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