

Sensitive Covid self-test in a coffee capsule

Wageningen scientists developed a cheap, sensitive Covid self-test in a coffee capsule, which they have dubbed CoronaEspresso.



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Vittorio Saggiomo at the laboratory of BioNanoTechnology came up with the device together with Professor Aldrik Velders. The CoronaEspresso uses the LAMP (Loop-mediated AMplification) technique to detect genetic virus material. Like the PCR test, this technique is much more sensitive than conventional antigen self-tests, says Velders. 'Usually, only severely infected people test positive with an antigen test.'

The LAMP technique works at a stable temperature of 65 degrees Celsius. When Saggiomo was forced to stay at home last year during lockdown, he started tinkering with ordinary things around the home. In his design, an empty coffee capsule serves as a minilab. It is filled with wax that melts at 65°C and floats in a pan of hot water (just taken off the boil). A 3D-printed lid with holes holds four mini test tubes in place for the reaction. After 25 minutes, the solution colour shows whether a sample is infected. 'Trials with samples of infected people that we did together with TNO gave the same

results for our test as for the PCR test,' says Velders. 'TNO is currently carrying out more quantitative comparisons of the sensitivity.'

PCR equipment can easily cost 30,000 euros whereas Velders estimates that the CoronaEspresso can be manufactured for 30 eurocents. What is more, the capsule can be reused and recycled, whereas the existing self-tests are single-use only.

However, the method is not yet sufficiently robust for self-testing at home. Several preparatory steps are required in various test tubes before the actual amplification of the genetic material (the LAMP) can take place. Velders: 'Something can go wrong with every step — especially with untrained users. That's why we are looking for funding for research on a method in which all processes take place in the same test tube.' The researchers think the test will be particularly valuable in remote areas and impoverished countries.

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