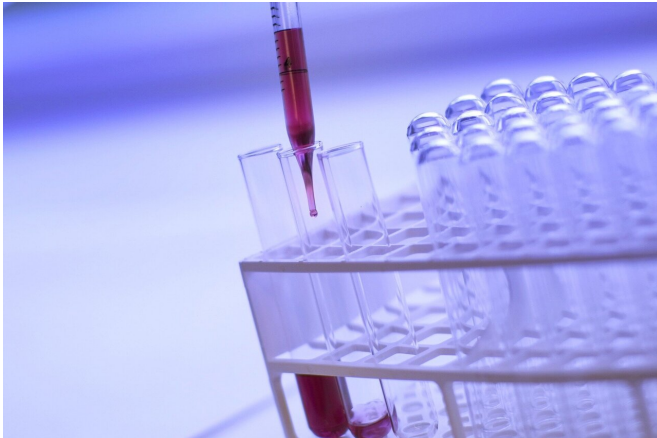# Covid19: a new automated test developed to detect the population by the tens of thousands

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The University of Liege announces that it has developed an automated test for the detection of SARS-CoV-2, the virus responsible for Covid-19. The technique developed at ULiege allows to increase the daily capacity of detection of the coronavirus in Liege by 2000 tests. ULiege thus becomes one of the 5 reference centres for the detection of SARS-CoV-2. The technique could quickly be adopted by the 4 other reference centres in Belgium (GSK, UCB, Janssen Pharmaceutica and KULeuven), as well as by other countries.

The test can detect carriers of the virus, whether they are sick or asymptomatic carriers. It is an automated test, less dependent on reagents at risk of shortage and requiring a reduced number of operators.

How does the test work?

It is based on three successive steps that provide a reliable result in half a day.

1st step: Inactivation of the virus.

The material in the sample tube (swab) is brought into contact with chemicals and enzymes. This step aims to inactivate the virus while preserving some of its components (genetic material), so that it can be detected in the subsequent procedure. This operation must be carried out in high-security laboratories of L2 or L3 type.

2nd step: Extraction of the virus.

The SARS-CoV-2 is an RNA virus; i.e. its genome does not contain DNA. This step aims to extract the viral RNA. Current extraction methods are either manual, requiring time and a large number of operators, or automated, relying on the use of reagents whose supply is no longer guaranteed. It is this step that was limiting and significantly hindered the performance of screening tests. Researchers from GIGA, FARAH, GreenMat/CESAM of ULiege and the University Hospital (CHU) of Liege joined forces to make this step faster, automated and independent of commercial reagents.

3rd step: Conversion of RNA to DNA, and DNA amplification

After the RNA is extracted, it is converted into DNA, which is then amplified a large number of times in order to be detectable. This step uses the qRT-PCR technique. The RNA is first transcribed (RT) to DNA using an enzyme (reverse transcriptase) and then amplified by quantitative (q) PCR (polymerase chain reaction). By using this method, the genesis of each copy of the SARS-CoV-2 viral RNA is associated with the emission of fluorescence, ultimately confirming whether the sample is positive

or negative.

With the exception of the inactivation step 1, which requires a larger number of people taking turns in the L2 and L3 laboratories, the other two steps require the simultaneous presence of only 4 people.

This automated, rapid and reliable technique for the detection of sick or asymptomatic carriers of the virus allows the ULiege team to carry out 2000 tests per day. The laboratories that have developed this method are now backed up by the clinical microbiology laboratory of the CHU of Liege for the performance of local tests, but will also be involved in mass screening, starting with systematic screening in rest homes where there are many people at risk.

The development of this technique is a major step towards providing Belgium, and potentially other countries, with the significant testing capacity necessary to manage the Covid-19 health crisis.

Provided by University de Liege