Researchers develop COVID-19 diagnostic test that is 10x faster

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Media outlets around the world have reported a shortage of COVID-19 testing materials. This shortage slows down the rate of testing and increases the rate of infection, as thousands of undiagnosed patients walk

around, unknowingly infecting healthy and at-risk populations. Now, Professor Nir Friedman at Hebrew University of Jerusalem (HU)'s Institute of Life Sciences and School of Engineering and Computer Science and Professor Naomi Habib at HU's Edmond and Lily Safra Center for Brain Science have developed a faster and cheaper way to test of COVID-19 using materials commonly found in diagnostic labs.

Testing for COVID-19 currently involves extracting RNA molecules from a patient's swab sample to see whether they contain viral RNA that confirms the presence of the COVID-19 virus. The new method developed by Friedman and Habib can do the same thing, only faster. As Habib shared, "The virus detection protocol we developed is four-to-ten times faster than the current protocol. It's based on magnetic beads and works both robotically and manually. The robotic protocol has already been tested at Hadassah Hospital and is now fully operational."

Another advantage of this new testing method is its low price. The test relies on materials that are readily available and easy to manufacture locally, making it significantly cheaper than imported kits. Magnetic beads are the only item in the protocol that still needs to be imported from overseas. However, these beads can be recycled and used again and again. As Friedman explained, "our COVID-19 test significantly reduces labs' dependence on external factors. To date, we've tested hundreds of clinical samples from Hadassah Hospital and our results were identical to those found by the kits currently being used."

The researchers' next step is to develop a method that would allow tens of thousands of samples to be tested simultaneously instead of the current rate of thousands of tests. This feat would be based on genomic sequencing and the results, so far, are promising. "We're encouraged by preliminary—and positive indications—that this method will work," added Friedman.

To complete their tests, Habib and Friedman teamed up with 15 researchers and lab students from the university. "It's very moving to see a large group of researchers so dedicated to finding a solution to our current crisis, one that will get Israel—and hopefully the rest of the world—back to normal," said Habib. That, indeed, would be good news for everyone.

Provided by Hebrew University of Jerusalem