UGM Leads RI-GHA Covid-19 Rapid Test Research Innovation

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Prof. dr. Sofia Mubarika Haryana, M.Med.Sc., Ph.D., as a professor from the Faculty of Medicine, Public Health, and Nursing (FK-KMK) UGM led the creation of an innovative rapid diagnostic test (RDT) for Covid-19 based on antibodies to detect IgM and IgG produced by the body against Covid-19.

"Formerly, when the Covid-19 pandemic appeared, we did think about what we could do to help with the treatment of Covid-19. Then the Agency for the Assessment and Application of Technology (BPPT) initiated research innovation on Covid-19," explained Prof. Rica on Friday (5/22).

BPPT invites numerous Indonesian researchers to join in the investigation of the effort to handle Covid-19. Prof. Rika from FK-KMK UGM considered as one of the researchers asked to come to its conducted research.

"My previous research was about a virus related to cancer, the Epstein-Barr Virus (EBV). I also study immunology and molecular biology; therefore, I am willing to join," she said.

In its development, there are six areas of research innovation that are becoming the focus of BPPT, one of which is a rapid diagnostic test. She has the experience of making rapid diagnostic tests for Epstein-Barr Virus (EBV) in patients with nasopharyngeal cancer and then chose to join the team to conduct research innovations in rapid diagnostic tests by collaborating with other researchers, namely Prof. dr. Tri Wibawa, Ph.D., Sp.MK (K), a virologist and Professor of FK-KMK UGM. There was also Prof. dr. Mulyanto, FK-KMK UGM Alumni as a researcher of the Mataram Hepatic Laboratory, West Nusa Tenggara.

Besides, I also joined Prof. Dr. drh. Fedik Abdul Rantam, Virologist, and Prof. Dr. dr. Cita Rosita Sigit Prakoeswa, Sp.KK (K)., Professor of Airlangga University, Surabaya. This rapid diagnostic test product is called RI-GHA, which is an extension of the Republic of Indonesia - Gadjah Mada - Hepatika - Airlangga.

Prof. Mulyanto compiled a formula for the Covid-19 rapid diagnostic test armed with the research experience he did in making rapid tests for hepatitis that currently used in Sakura country, Japan. The testing process uses Covid-19 positive serum obtained from the National Board of Health Research and Development.

"After the results were positive, then we also conducted a comparative test with commercial products. It turns out that the commercial product in circulation is total Immunoglobulin, so it's not precise, and it's not like the total IgM or IgG that we developed," explained Rika related to the process of developing this rapid diagnostic test.

The test results showed that from 20 samples with positive IgM, RI-GHA products obtained 8 positives. Furthermore, compared to the best commercial brands, there are also eight positive results obtained.

"It means that the Covid-19 positive sample that was previously tested by PCR resulted in 20 turns out to produce eight new antibodies, possibly the remaining antibodies have not yet formed," she said.

Using the initial data of this comparative test, the team conducted an online registration process and a marketing authorization process.

According to Rika, from the total production of 10,000 tests, as many as 4,000 tests will be submitted for validation tests to get high accuracy in the community.

UGM conducted the validation test in Dr. Sardjito, UGM Academic Hospital, Yogyakarta City Hospital, Dr. Kariadi Semarang, and RSUD Dr. Moewardi Solo, led by Prof. Tri Wibawa. Besides, the validation test was also carried out by Prof. Citra Rosita and Prof. Fedik and the team at RSUD Dr. Soetomo and UNAIR Hospital.

Rika also explained, besides being used for screening, this Rapid Non-PCR Diagnostic can also be used to monitor OTG, ODP, PDP, or post-infection. Moreover, although the cost is relatively cheap, this rapid diagnostic test can detect 5-10 minutes fast, easy, practical, high sensitivity, and very specific. This non-PCR rapid diagnostic can be done anywhere, such as roads, schools, markets, stations, airports, and others.

"Hopefully, the research will have excellent validity test results, and it has high accuracy so that it can be used for extensive screening in the community. We hope it can also be sent to distant areas, so that people can do it independently, with previously trained how to use it through national television," she concluded.

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