

「Japan group has developed a multi-variant COVID-19 test」

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The spread of the novel coronavirus variants has become a serious problem worldwide and Japan as well. For variant viruses, the time and effort required for measurement and the time required to process many samples have also increased a lot of the burden of testing. At present, Japan is also about to issue its third emergency declaration in the near future because of worrying that the variant virus will result in another infection outbreak.

On April 19, a group of Japanese research teams stated that they have developed a technique called "pi code method" that can identify more than 100 coronavirus variants in a single test. The members of this group include the infectious disease expert Tateda Kazuhiro, a professor from Japan Toho University professor and Denka Co., Ltd.

The "pi code method" has been developed by PlexBio Co., Ltd., a business alliance with Denka Co., Ltd. This technology enables simultaneous multi-item measurement by identifying the type of test target by fixing a probe for antibody or gene measurement to a magnetic micro disk with a barcode engraved on the surface. The combination of π -code technology with fluorescence measurement technology will achieve both high sensitivity and simultaneous multi-item measurement. The fluorescence method is a widely used technology that recognizes an object with high sensitivity by attaching a fluorescent label to the object to be measured and measuring the fluorescence, but in principle it is difficult to measure multiple items. This new system can identify the target by recognizing the barcode engraved on the disk surface as an image, further achieving simultaneous multi-item measurement.

In the current COVID-19 multi-variant test, they use discs measuring just 0.04 millimeters across that have a barcode-like pattern on their surface. A reagent that emits light when it reacts with genes unique to mutations is applied to the discs, which are mixed with a virus sample. The group says that theoretically, a sample could be checked for more than 100 types of mutations by using multiple discs designed to react to different targets. The members say a special device will read the barcode patterns to automatically identify discs that have emitted light. This allows scientists to determine the mutations in the sample.

Since this multi-variant test system can simultaneously detect multiple types of the novel coronaviruses including England type, Brazilian type, South African type, and California type, it is expected that it will lead to reduction of labor and quick detection.

According to Denka's news release, they have started a verification experiment in collaboration with Professor Kazuhiro Tateda and Professor Yoshikazu Ishii (Microbial and Infectious Diseases Course) of

Toho University School of Medicine. They have obtained promising results in the early stages and they aim to sell it as a variant detection system to measuring institutions within 1 to 2 months.

Reference:

1. 2021 Apr 19 "100 余の新型コロナ変異ウイルス 同時に判別可能な技術を開発" *NHK News*.
2. 2021 Apr 19 "Japan group develops multi-variant detector" *NHK World Japan*.

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