H5N1 bird flu diagnostic kit detects all known strains of virus with a single test

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A close collaboration between scientists from the Experimental Therapeutics Centre (ETC) under the Agency for Science and Technology Research (A*STAR) and clinicians from Tan Tock Seng Hospital (TTSH) has enabled the successful development of the most comprehensive and rapid H5N1 bird flu test kit available to date. With this highly advanced kit, doctors can now rapidly detect all existing strains of the H5N1 viruses in a single test with almost 100% accuracy, within a few hours. This is a big boost to public healthcare system and a great stride forward in pandemic preparedness against this highly infectious disease worldwide.

The bird flu virus, scientifically termed as the Avian Influenza virus, is usually lethal to the birds and normally does not transmit to humans. However, highly lethal and contagious strains like H5N1 Avian Influenza A virus that can 'jump' from birds to human have been reported to cause serious infections and even death rates as high as 60% in infected patients. Although anti-viral treatment is available, the potential for H5N1 bird flu virus to spark a pandemic remains a serious threat to public health as most humans do not have immunity to the H5N1 virus. Therefore, to successfully curb the spread of the disease during an outbreak, accuracy and speed of detection on the type of H5N1 virus is of essence for effective infection control intervention and patient management.

The current gold standard for H5N1 detection recommended by the World Health Organization (WHO) is only able to detect three out of the

10 distinct genetic groups (clades 1, 2 and 3). To detect all existing strains of H5N1 with the WHO detection method would not be possible. The made-in-Singapore H5N1 test kit, which is more accurately known as the H5N1 real-time Reverse Transcription Polymerase Chain Reaction (RT-PCR) assay, is the only detection kit currently available on the market that can accurately and rapidly detect all known strains of the H5N1 Avian Influenza A virus in a single test within a matter of hours.

Co-developed by Dr. Masafumi Inoue, a Senior Research Scientist and Project Director of Technology Development from ETC and Dr. Timothy Barkham, a senior consultant of Laboratory Medicine from TTSH, this newly launched H5N1 test kit has been clinically validated by several hospitals in Southeast Asia.

“We are excited to be able to contribute to the fight against H5N1 virus with our expertise and know-how. Our technology has greatly simplified and accelerated the process of detection and identification of new H5N1 variants. Such information is especially critical when the virus mutates to become more dangerous, such as in drug resistance.” said Dr. Inoue.

To enhance its usability, this new H5N1 test kit is also purposefully designed to be compatible with the previously launched “4-plex” Influenza diagnostic kit. The latter is already adopted for use by several regional hospitals in Thailand. Using such multiplex assays enables simultaneous detection and differentiation of the different types of influenza infection in a single test, which will save hospital labs and clinicians significant time and cost.

“While there have not been any reported H5N1 cases in Singapore, this mutating subtype of influenza virus type A continues to be a concern. The ability to detect and characterise influenza strains remains important in the management of the disease. With this latest H5N1 assay, we can easily combine it with our previous 4-plex Influenza kit to differentiate

which strain of Influenza is present with one test, giving a definite diagnosis and faster turnaround for our patients and our colleagues in infection control and public health," said Dr. Barkham.

Local Small and Medium Enterprise (SME), AITbiotech Pte Ltd, a regional provider of genomic services and molecular diagnostics kits, has recently signed a licence agreement with Exploit Technologies Pte Ltd (ETPL), the technology transfer arm of A*STAR, to market this H5N1 kit regionally.

"The new H5N1 test kit from A*STAR is a significant addition to AITbiotech's existing portfolio of products for Influenza virus screening and surveillance. In light of the recent H5N1 outbreak in this region, we believe that this test can play a vital role for governments and public health institutions to effectively fight and control the outspread of any H5N1 virus", said Mr Alex Thian, Founder and Chief Executive Officer of AITbiotech.

Previously, AITbiotech has acquired several other molecular diagnostic licenses from ETPL for swine flu mutation surveillance and for multiple pathogens detection, including Dengue, Chikungunya and Mycobacterium Tuberculosis.

"Licensing these highly sophisticated assays from A*STAR has given AITbiotech a springboard into the highly competitive market of Molecular Diagnostics. With our expanded capabilities, we are now able to provide a comprehensive suite of diagnostic services for a range of infectious diseases to the research, healthcare and biomedical industries in Singapore and Asia," added Mr. Thian.

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