

Made-in-Singapore H5N1 Bird Flu Diagnostic Kit - Detects all known strains of H5N1 Virus with a single test

Licence agreement signed between local SME, AITbiotech and A*STAR to market the test kit will directly benefit public healthcare sector in the fight against infectious diseases



Figure 1. Made-In-Singapore H5N1 Bird Flu Diagnostic Kit – detects all known strains of H5N1 virus with a single test

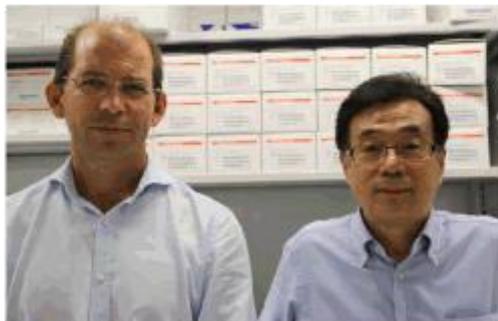


Figure 2. Dr Masafumi Inoue from A*STAR's Experimental Therapeutic Centre (right) and Dr Timothy Barkham from Tan Tock Seng Hospital, co-developed the H5N1 bird flu test kit



Figure 3. Mr Alex Thian, CEO of AITbiotech Pte Ltd – local SME that acquired the molecular diagnostic license for the H5N1 test kit

The 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 Influenza¹ 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 patients². 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)³ 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 realtime 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 strains⁴ 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 kit⁵. 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 types⁶ 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 characterize 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.

"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.

"This collaboration between A*STAR, TTSH and AITbiotech is a great example of how public and private sectors can partner to drive impact in Singapore's healthcare and biomedical industries. We remain committed in our role to transfer A*STAR technologies to help SMEs like AITbiotech stay competitive by delivering products with direct societal benefits," said Philip Lim, CEO of ETPL.

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About Exploit Technologies Pte Ltd (ETPL)

Exploit Technologies is the technology transfer arm of the Agency for Science, Technology and Research (A*STAR). Its mission is to support A*STAR in transforming the economy through commercialising R&D. Exploit Technologies enhances the research output of A*STAR scientists by translating their inventions into marketable products or processes.

Through licensing deals with industry partners and spin-offs, Exploit Technologies is a key driver of technology transfer in Singapore. It actively engages industry leaders and players to commercialise A*STAR's technologies and capabilities, bridging the gap from Mind to Market. Exploit Technologies' charter is to identify, protect and exploit promising intellectual property (IP) created by A*STAR's research institutes.

For more information, please visit www.exploit-tech.com.

About the Experimental Therapeutics Centre (ETC)

ETC was set up in 2006 to play an increasingly important role in translating early stage scientific discoveries into practical applications. From engaging in early stage drug discovery and development to developing innovative research tools for clinical analysis, as well as setting up public-private partnerships to facilitate the advancement of drug candidates, ETC augments Singapore's capabilities and resources in the drug discovery process. ETC's capabilities and resources are currently focused on oncology and infectious diseases. It also incubates new technologies for commercialisation and mentors young scientists for careers in the pharmaceutical and biotech industry. For more information about ETC, visit www.etc.a-star.edu.sg.

About the Agency for Science, Technology and Research (A*STAR)

A*STAR is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based and innovation-driven Singapore. A*STAR oversees 14 biomedical sciences and physical sciences and engineering research institutes, and six consortia and centres, located in Biopolis and Fusionopolis as well as their immediate vicinity.

A*STAR supports Singapore's key economic clusters by providing intellectual, human and industrial capital to its partners in industry. It also supports extramural research in universities, hospitals, research centres, and with other local and international partners.

For more information about A*STAR, visit www.a-star.edu.sg.

About Tan Tock Seng Hospital (TTSH)

TTSH is one of Singapore's largest multi-disciplinary hospitals with more than 160 years of pioneering medical care and development. The hospital has 36 clinical and allied health departments, 15 specialist centres and is powered by 7 more than 6,000 healthcare staff. TTSH sees over 2,000 patients at its specialist clinics and some 460 patients at its emergency department every day. TTSH is part of the National Healthcare Group, providing holistic and integrated patient care.

With a strong quality culture steeped in patient safety, TTSH constantly challenges itself to provide faster, better, cheaper and safer care for patients.

To achieve this, the hospital keeps abreast and believes in investing in its staff, facilities, medical technology and system improvements. In recognition of its commitment to excellent patient care and its comprehensive range of quality healthcare services, TTSH has been awarded the ISO 9001 certification and the prestigious Joint Commission International (JCI) accreditation.

For more information, please visit www.ttsh.com.sg.

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About AITbiotech Pte Ltd

AITbiotech is leading Genomic Services and MDx company based in Singapore. Founded by Alex Thian in 2006, it has a core services and R&D laboratory in Singapore managed by a team of experienced biotechnologists. It provides a complete suite of Genomic Services including DNA Synthesis, Next Generation Sequencing Services, CE DNA Sequencing Services, Bioinformatics Services, PCR and Plasmid Prep Services, MDx PCR Assays and Kits to the research, healthcare and biomedical industries in Singapore and Asia.

For more information, please visit www.AITBiotech.com.

References:

1. Avian influenza (AI) is a highly contagious viral disease of birds that often does not cause apparent signs of illness in infected animals. AI viruses can sometimes spread to domestic poultry and cause large-scale outbreaks of serious disease. The highly pathogenic H5N1 virus first infected humans in 1997 during a poultry outbreak in Hong Kong SAR, China. Since its widespread re-emergence in 2003 and 2004, it has spread from Asia to Europe and Africa and has become entrenched in poultry in some countries, resulting in millions of poultry infections, several hundred human cases, and many human deaths. <http://www.who.int/mediacentre/factsheets/fs274/en/>
2. <http://www.cdc.gov/flu/avianflu/h5n1-people.htm>
3. <http://www.who.int/influenza/resources/documents/RecAllabtestsAug07.pdf>
4. There are more than 40 sub-clades or distinct strains of the H5N1 virus currently identified by WHO
http://www.who.int/influenza/resources/documents/2011_09_h5_h9_vaccinevirusupdate.pdf , http://are.berkeley.edu/~dwrh/Docs/Vet_Journal110123.pdf
5. <http://www.astar.edu.sg/Media/News/PressReleases/tabid/828/articleType/ArticleView/articleId/1341/Default.aspx>
6. Together, the new H5N1 kit and the 4-plex Influenza kit will allow detection and sub-typing of 2009H1N1, H3N2, H5N1, Flu A and Flu B viruses in a single test. pathogens detection, including Dengue, Chikungunya and Mycobacterium Tuberculosis.