

Media Release

Breakthrough Research Reveals Widespread Presence of Foodborne *Streptococcus Agalactiae* Across Southeast Asia in Humans and Tilapia

- *TTSH-led study found sequence type ST283 group B Streptococcus causing disease in humans and tilapia across SE Asia; it is not unique to Singapore*
- *Singaporeans should consider Ministry of Health's advisory when travelling to neighbouring countries*

Singapore, 10 July 2019 – Researchers at Tan Tock Seng Hospital (TTSH) have identified the group B Streptococcus (GBS) bacteria that caused the fish borne outbreak of blood poisoning in Singapore in 2015 as a strain called ST283. Over 160 people were admitted to hospital with fever, and invasive infections such as septic arthritis and meningitis, after consuming raw freshwater fishes.

Led by TTSH, a network of 30 collaborators has now found that GBS ST283 disease is not unique to Singapore; although previously undetected, ST283 is widespread in S.E.A and has been affecting humans and farmed fish (aquaculture) across the region for decades. ST283 was found in all invasive Asian collections analysed, from 1995 to 2017. It accounted for 76% of human GBS in Lao PDR, 73% in Thailand, 31% in Vietnam, and 23% in Singapore. ST283 was found in diseased tilapia sampled from 14 sites in Malaysia and Vietnam between 2007 and 2016.

The research, titled “One hypervirulent clone, sequence *type 283, accounts for a large proportion of invasive streptococcus agalactiae* isolated from humans and diseased tilapia in Southeast Asia”, is a first for investigations on the regional prevalence of GBS ST283. Published in the Journal ‘*PLoS Neglected Tropical Diseases*’, the study reveals that GBS ST283 is causing a chronic regional outbreak, undetected due to underdeveloped surveillance systems in One Health, a concept that encompasses humans, animals and the environment.

Dr Timothy Barkham, Senior Consultant Medical Microbiologist at the Department of Laboratory Medicine, TTSH, said, “Creation of cross-border collaborations in human and animal health are needed to complete the epidemiological data of GBS ST283, and to identify opportunities to interrupt transmission. Our research reveals a previously unknown disease pattern that had escaped detection. Our findings are an example of what we might discover if we implement modern genomic methods in our daily work.”

TTSH is currently working with A* STAR’s Genome Institute of Singapore (GIS) (which performed the genomic sequencing and analysis of the current study), and the rest of its international research team, to determine ST283’s origin, its geographical extent, transmission and pathogenicity in order to help curb the disease.

Professor Swaine Chen, Group Leader of Infectious Diseases at GIS, said, “Infectious diseases can be different across various parts of the world. This latest study now explains why we did not know about foodborne GBS until 2015 – ST283 is nearly exclusively found in Southeast Asia, largely over the past 20 years. GBS is not thought to be a foodborne disease in the rest of the world, so no one ever looked for it in Southeast Asia. This highlights how collaborations across the public agencies in clinical and genomic research into local microbiology, in Singapore and the region, are crucial to improving healthcare and food safety.”

The Food and Agriculture Organisation of the United Nations (UN FAO) is also in the process of entering into an agreement with TTSH to lead an international review of the data. Once this agreement is finalized, TTSH will convene an expert microbiological assessment.

The research team has been funded by few grants namely, the Singapore Infectious Disease Initiative, the UK Global Challenges Research Fund which supported an international network, called SEA-BeaSt, as well as the Singapore Millennium Foundation Research Grant to study foodborne transmission of other GBS.

The findings in this research are a good reminder of the advisory jointly issued by Ministry of Health and AVA in 2015, advising consumers not to eat ready to eat (RTE) dishes containing raw freshwater fish. In the same year, the Singapore government passed a ban to stop stall owners from selling RTE raw freshwater fish to consumers.

Singaporeans should still be mindful of the advisory, and avoid consuming raw or undercooked fishes when they are travelling to neighbouring countries, as similar local food regulations are not in place. These measures will prevent them from being infected or being at risk of carrying the strain back home. Cooking raw food thoroughly with sufficient heat is still the most effective way to destroy microbial pathogens - ensuring the fishes are safe to eat.

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About Tan Tock Seng Hospital (TTSH)

TTSH is one of Singapore's largest multi-disciplinary hospitals with 175 years of pioneering medical care and development. The Hospital has 61 clinical disciplines and 3 institutes that are spearheading care, research and innovations in geriatric medicine and ophthalmology. With more than 1,600 beds and powered by 9,000 healthcare staff, TTSH sees over 2,700 patients at its specialist clinics and some 450 patients at its emergency department every day. With a strong quality culture steeped in patient safety, TTSH actively challenges itself to provide faster, better, cheaper and safer care for patients by investing in its staff, facilities, medical technology and system improvements. TTSH is part of the National Healthcare Group, providing holistic and integrated patient care.

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

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About A*STAR's Genome Institute of Singapore (GIS)

The Genome Institute of Singapore (GIS) is an institute of the Agency for Science, Technology and Research (A*STAR). It has a global vision that seeks to use genomic sciences to achieve extraordinary improvements in human health and public prosperity. Established in 2000 as a centre for genomic discovery, the GIS will pursue the integration of technology, genetics and biology towards academic, economic and societal impact.

The key research areas at the GIS include Human Genetics, Infectious Diseases, Cancer Therapeutics and Stratified Oncology, Stem Cell and Regenerative Biology,



Cancer Stem Cell Biology, Computational and Systems Biology, and Translational Research.

The genomics infrastructure at the GIS is utilised to train new scientific talent, to function as a bridge for academic and industrial research, and to explore scientific questions of high impact.

For more information about GIS, please visit www.a-star.edu.sg/gis.