Press Release

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Found - human antibody that kills the dengue virus

Discovery could pave the way for new therapy to treat dengue infection

SINGAPORE - A team of research scientists here have uncovered a human antibody that can neutralize and kill the dengue virus within two hours. A way to reproduce this antibody in large quantities has also been identified, potentially opening the door to a cure for dengue-infected patients.

This discovery was made by a combined team from the NUS Yong Loo Lin School of Medicine, Duke-NUS Graduate Medical School and the Defence Medical & Environmental Research Institute at DSO National Laboratories (DMERI@DSO) with funding from the Singapore National Research Foundation under its Singapore NRF Fellowship, National Medical Research Council and DR Tech.

By studying a group of cell lines from recovered dengue-infected patients over a period of two years, the team identified a recombinant antibody that could attach itself strongly to a specific part of the dengue virus and inhibit it from attacking other cells. The antibody eventually destroys the virus and at a much faster speed compared to existing anti-dengue compounds. It has been proven to increase the survival in a mouse model infected with the dengue virus.

The World Health Organization estimates there may be 50–100 million dengue infections worldwide every year. With no approved vaccines or specific treatment available and with vector control as the only method for prevention, dengue continues to be a public health concern.

To complicate matters, there are four dengue serotypes (DENV1 to DENV4), and infection with one dengue serotype means lifelong immunity to that type but only partial and temporary protection against the other three. Developing a vaccine against dengue has thus been challenging, made more so because of a global, urgent need for new treatment to manage this disease.

This newly discovered antibody specifically treats DENV1, which accounts for up to 50% of the dengue cases in Singapore and other Association of Southeast Asian Nation countries. To ensure its effectiveness, the team tested this new antibody with DENV1 types from these countries – with equally promising results, said Associate Professor Paul Macary of the NUS Yong Loo Lin School of Medicine’s Department of Microbiology. He is the Principal Investigator who led the research team.

“We knew the antibody exists based on the fact that most patients recover naturally from dengue infection, but the chances of finding it would be like finding a needle in a haystack. We are very encouraged by this breakthrough. This represents the best candidate therapy
that currently exists for dengue and thus is likely to be the first step in treating dengue infected patients who currently have no specific medicine or antibiotic to take and may take days to fully recover.”

Added Dr Brendon Hanson, Head, Bio-Defence Therapeutics Lab, DMERI@DSO, “Being a completely human antibody, it is likely to have no serious side effects and this makes not only this antibody, but the approach we took to isolate antibodies from recovered patients an attractive one.”

Said Assistant Professor Lok Shee-Mei of the Duke-NUS Graduate Medical School Singapore, “The journey in finding this antibody that effectively treats dengue virus serotype 1 virus infection has been very fulfilling. Now we will be on our next quest to find other antibodies that treat Dengue serotypes 2, 3 and 4 infection. We hope to combine these antibodies into one concoction in the near future to treat each serotype and improve patient outcomes.”

Moving forward the team will be embarking on a clinical trial in the next 12 -16 months and expects a therapy to be available within the next 6 - 8 years. The team hopes to uncover antibodies for the other dengue types within the next two years.

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About the NUS Yong Loo Lin School of Medicine (YLLSoM)

Established in 1905, the NUS Yong Loo Lin School of Medicine was the first institution of higher learning in Singapore and the genesis of what would become the National University of Singapore. The School offers one of the finest undergraduate medical programs in the Asia Pacific region and commands international recognition and respect. In 2011, the School was ranked the top university in Asia for medicine and was placed 18th globally by Quacquarelli Symonds (QS).

From Academic Year 2012/13, the School will admit 300 students to its medical undergraduate degree programme annually. The School strives to fulfil its tripartite mission of providing excellent clinical care, training the next generation of healthcare professionals, and fostering research that will transform the practice of medicine. It plays a pivotal role in producing future leaders in healthcare delivery, discovery and public service as well as in Singapore’s Biomedical Sciences Initiative and Singapore Medicine, a medical tourism initiative.

The School’s 17 departments in the basic sciences and clinical specialties work closely with the Alice Lee Centre for Nursing Studies, the Centre for Biomedical Ethics, and the Centre of
Excellence for Health Services Research to ensure that teaching and research are aligned and relevant to Singapore’s healthcare needs.

For more information about the Yong Loo Lin School of Medicine, please visit [http://medicine.nus.edu.sg/corporate/](http://medicine.nus.edu.sg/corporate/)

**About Duke-NUS Graduate Medical School Singapore**

The Duke-NUS Graduate Medical School Singapore (Duke-NUS) was established in 2005 as a strategic collaboration between the Duke University School of Medicine, located in N.Carolina, USA and the National University of Singapore (NUS). Duke-NUS offers a graduate entry, 4-year M.D. (Doctor of Medicine) training program based on the unique Duke model of education, with one year dedicated to independent study and research projects of a basic science or clinical nature. Duke-NUS also offers M.D/PhD and PhD programs. As a player in Singapore’s biomedical community, Duke-NUS has identified five Signature Research Programs: Cancer & Stem Cell Biology, Neuroscience and Behavioral Disorders, Emerging Infectious Diseases, Cardiovascular & Metabolic Disorders, and Health Services and Systems Research. For more information, please visit [www.duke-nus.edu.sg](http://www.duke-nus.edu.sg).

**About DSO National Laboratories**

DSO National Laboratories (or DSO in short) is Singapore’s national defence research and development organisation. It undertakes indigenous development of advanced defence and weapon systems that provide the Singapore Armed Forces (SAF) with the superior technological edge in the battlefield. While its primary focus is to support the SAF, DSO also extends its defence R&D capabilities to support homeland security. With more than 1,000 research scientists and engineers, DSO researches into emerging technologies, matures promising ones and integrates them into innovative system concepts to meet Singapore’s defence and security needs. For more information, please visit [www.dso.org.sg](http://www.dso.org.sg).