

# NUS study could lead to better flu medication

Study shows that blocking proteins hijacked by the flu virus can stop spread of infection

## Cheryl Tee

More effective flu medicines could be in the pipeline, with a recent breakthrough by National University of Singapore scientists in understanding how the flu virus infects people.

The Yong Loo Lin School of

Medicine study found that flu viruses can hijack a class of proteins called CD151, which are part of human respiratory cells.

An active CD151 protein allows the virus to enter or leave the nucleus of its host cell.

Blocking it stops the spread of infection, as newly produced viral material cannot leave the nucleus. Typ-

ically, a virus clones itself and multiplies in the nucleus before leaving to infect other cells.

"When CD151 expression is lost, you're taking away the key to the gate. The virus does not have the key to exit," said Assistant Professor Thai Tran from the Department of Physiology. She is the study's lead principal investigator.

Trapped in the nucleus, the virus accumulates, which gives the body's immune system time to stave off the infection.

The study began in September 2016 and was funded by the Ministry of Education and the National Medical Research Council.

The current stable of flu treatments largely targets viruses instead

of humans. Some of these work by blocking viral proteins so they cannot bind to host cells. Vaccines aim to find the "best match" for a particular flu season by predicting the key proteins on the outer coat of the flu virus months in advance.

But since the flu virus mutates every few months, vaccines find themselves playing catch-up.

Other treatments, like Tamiflu, stop viruses from replicating. But these are effective only if given early in the infection, and if overused, they lose their potency due to viral resistance, said Prof Tran.

According to the World Health Organisation, the flu affects about one billion people a year, killing up to 650,000 people.

In Singapore, an average of 3,000 patients daily seek treatment at polyclinics for flu-like illnesses, going by 2018 statistics from the Ministry of Health.

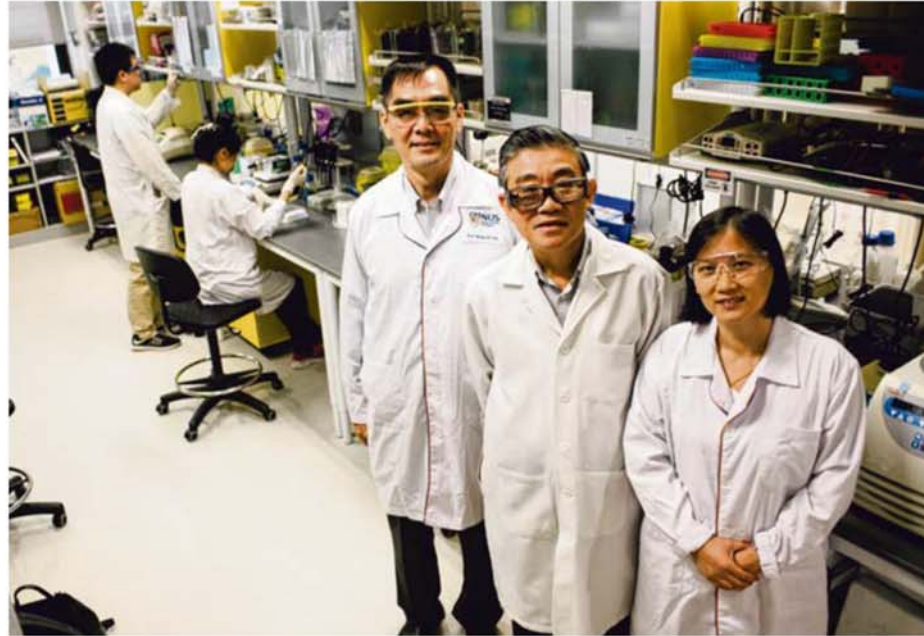
Prof Tran and her team hope to develop CD151 blockers for most flu viruses, such as the common and often fatal H1N1 and H3N2 strains.

They will also look to adapt it for viruses which share a similar transmission route, such as the human papillomavirus for cervical cancer and the human T-cell leukaemia virus type 1 for adult T-cell leukaemia.

Professor Paul Tambyah, senior consultant at the National University Hospital's Division of Infectious Diseases, said: "Our current range of drugs available for the treatment of influenza is very limited. If this leads to a new class of drugs which can be used to treat influenza and its complications, it will be a great step forward in efforts to not only treat common (seasonal) flu, but also prepare for a flu pandemic."

The study was published in the online issue of the *Journal of Allergy and Clinical Immunology*.

teemin@sph.com.sg



The Yong Loo Lin School of Medicine team behind the breakthrough study: (from left) Professor Wang De Yun from the Department of Otolaryngology, Associate Professor Vincent Chow from the Department of Microbiology and Immunology, and Assistant Professor Thai Tran from the Department of Physiology. ST PHOTO: ALVIN HO