

NUS team taps AI to evaluate drugs here for treating Covid-19

Digital platform to assess most effective mix from set of 12 locally accessible drugs

Cheryl Tan

A group of researchers in Singapore will tap their artificial intelligence (AI) platform to evaluate 12 locally available drugs to derive a combination that can be used to treat Covid-19.

The interactive digital platform, known as iDentif.AI, leverages AI to calculate the most effective combination of drugs – along with their respective doses – from more than 530,000 possibilities.

The researchers are from the Institute for Digital Medicine (WisDM) at the National University of Singapore's (NUS) Yong Loo Lin School of Medicine.

They found in a study done in April that the optimal drug combination comprised remdesivir, lopinavir and ritonavir, which are used to treat patients with the human immunodeficiency virus, or HIV.

Their findings were validated using live virus in cell culture, and they have been pre-emptively cleared for testing in a clinical trial in Taiwan, should the need arise.

Professor Dean Ho, director of WisDM, told *The Straits Times* yesterday that the “combination enabled near-complete inhibition of the virus, but remdesivir isn't readily available, which is a challenge we will address in follow-on studies.”

So, the research team will evalu-

ate instead a set of 12 locally accessible drugs ranging from anti-virals to targeted therapies and other agents.

Remdesivir, which is among the very few authorised treatments for Covid-19, inhibited the virus by 15 per cent, as initially validated by iDentif.AI. So, it is used as a benchmark for the new set of drug combinations, said Prof Ho.

A clinical trial by the World Health Organisation on Thursday found remdesivir had little or no effect on Covid-19 patients' length of hospital stay or chances of survival, although the results of the trial have not yet been reviewed.

Prof Ho said: “In addition, remdesivir has to be administered in hospitals through an intravenous infusion, which could make it challenging to deploy if there are many Covid-19 patients in the community.”

“Therefore, we are looking to investigate drugs available in tablet form so they can be consumed orally.”

These drugs would also be easier to dispense and can be potentially administered at home, he added.

A study to find out the effectiveness of the new set of drug combinations will be done next month.

The researchers have also been able to leverage their AI technology to offer personalised treatments for cancer patients.

Using another platform known as CURATE.AI, drug doses given to

patients can be modulated to produce optimal results throughout the duration of their care.

Assistant Professor Raghav Sundar, who is from the NUS Department of Medicine and WisDM, and a consultant with the Department of Haematology-Oncology at the National University Cancer Institute, said: “Drug dosing in cancer treatments is typically based on the degree of side effects experienced by the patient.”

“With CURATE.AI, each patient's recommended dose is calibrated using clinical data generated from their individual response to treatment.”

For instance, in a pilot clinical study done with a United States-based hospital, a patient with advanced prostate cancer was recommended a 50 per cent reduction in dose of an investigational inhibitor drug for increased efficacy.

The patient was able to resume an active lifestyle as the lower dose was found to be more tolerable.

Similarly, a patient in Singapore with advanced cancer was given a reduced dose of nab-paclitaxel – a type of chemotherapy drug – which stopped his cancer from progressing and reduced the size of his lung tumour. This allowed the patient to continue treatment for a longer duration without suffering toxic side effects, compared with other patients given the same drug.

The findings have led to a clinical pilot trial that is now recruiting patients.

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(From left) Dr Alexandria Remus, Professor Dean Ho and Dr Takashi Obana are researchers from the Institute for Digital Medicine at the National University of Singapore's Yong Loo Lin School of Medicine who have worked on the iDentif.AI and CURATE.AI platforms dealing with drug combinations and doses. ST PHOTO: TIMOTHY DAVID