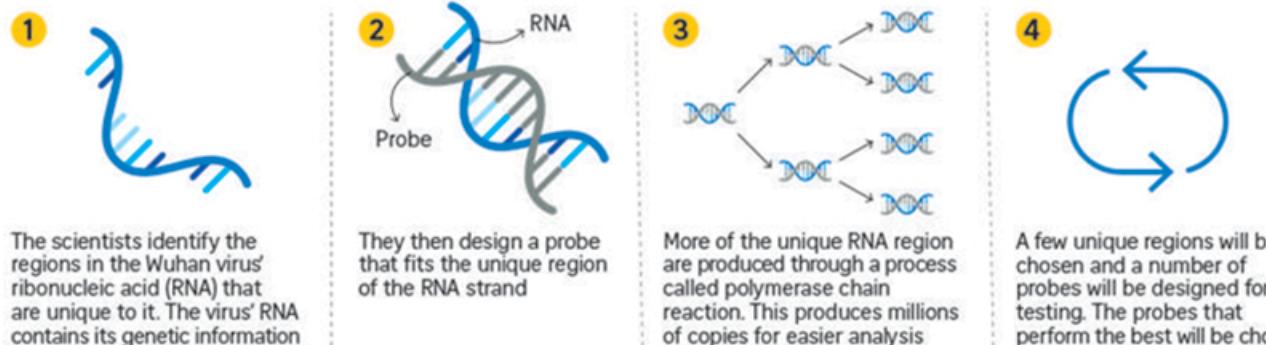## Developing a detection kit

Scientists from the Home Team Science and Technology Agency (HTX) are developing a probe to test for the Wuhan virus, which has been described as a novel coronavirus that has a genetic make-up similar to that of the Severe Acute Respiratory Syndrome (Sars) virus. This is how it is being done.



Dr Oh Hue Kian, deputy lab manager at HTX, extracting samples.

**1** The scientists identify the regions in the Wuhan virus' ribonucleic acid (RNA) that are unique to it. The virus' RNA contains its genetic information

**2** They then design a probe that fits the unique region of the RNA strand

**3** More of the unique RNA region are produced through a process called polymerase chain reaction. This produces millions of copies for easier analysis

**4** A few unique regions will be chosen and a number of probes will be designed for testing. The probes that perform the best will be chosen

**5** Once the probes are made into a detection kit, it can be used to test for whether the Wuhan virus is present in samples. The entire process can take a few months

Source: HTX   ST PHOTO: JASON QUAH   SUNDAY TIMES GRAPHICS

# S'pore team working on test for Wuhan virus

### Test may take nearly two months to develop, but it's a longer wait for commercial kits

**Lim Min Zhang**

While the mystery flu that has hit the Chinese city of Wuhan has not reached Singapore's shores, scientists with the Home Team have already begun working on a way to test for the virus.

This comes after China recently released a draft genome of the newly discovered virus, which has seen 45 confirmed cases in Wuhan, as well as infections confirmed in Japan and Thailand.

Spearheading the development of the test kit is the Chemical, Biological, Radiological, Nuclear and Explosive Centre of Expertise under the recently formed Home Team Science and Technology Agency (HTX).

The centre's director May Ong told The Sunday Times that designing a probe to test for specific viruses within hours could take two to three weeks. Testing the probe could take another month, including making sure the test is reliable – meaning it produces a low number of false positives – and specific to the so-called Wuhan virus, rather than other viruses in the same family.

Ms Ong, who was a chemical defence researcher with DSO National Laboratories before joining the Ministry of Home Affairs in 2008, is also seeking the full genome sequence from China to better refine the probe. "The probe that can be developed based on the initial sequence could also 'catch' other viruses from the same family, such as Sars, thus we need the complete sequence," she said. "With more information, the detection of the virus would be more specific."

While there may be other research organisations and firms on a similar mission, it is important for Singapore to have its own capabilities as commercial kits could take six months or more to develop, she said.

An "initial genome" of the virus, taken from a sample from an infected patient, was posted on an open-access site, virological.org, on Jan 10 by a consortium led by Professor Yong-Zhen Zhang of Fudan University in Shanghai.

The Ministry of Health said yesterday that the latest suspected case was a 52-year-old Singapore resident with pneumonia, who had travelled to Wuhan. His condition was stable but he had been admitted for further assessment and treatment, and isolated as a precautionary measure.

Five earlier cases in Singapore have been cleared.

The World Health Organisation has said the Wuhan virus is a newly emerging strain of coronavirus with "some limited human-to-human transmission" and warned of a potential wider outbreak. Coronaviruses are a large family of viruses that cause a variety of infections ranging from the common flu to more severe cases like the Middle East respiratory syndrome.

To prepare for any possible outbreaks, the Home Team might step up checks at its borders to ensure quick identification of infected people.

A machine called a bio-sampler collects air samples from six land and sea checkpoints daily, including the Tanah Merah Ferry Terminal, the Singapore Cruise Centre at Harbourfront, and the Woodlands and Tuas checkpoints.

From these samples, HTX scientists can detect all known strains of flu viruses that could be transmitted to humans in three hours. These checks also monitor biochemical agents such as anthrax, ricin, and the plague.

Ms Ong said the team is prepared to step up its collection of samples from the current twice a day, to four times if needed.

"We send our results to the Health Ministry. Past data has shown that viruses detected at the borders coincided with an increase in hospital and clinic visits several weeks later," she added.

mzlim@sph.com.sg