Tailoring treatment for cancer patients

NUS team finds faster way to grow tumour clusters for drugs to be tested on them

Samantha Boh

Scientists here are a step closer to developing cancer treatments tailored for individual patients, which are more effective and less intrusive.

Their dream is for each customised treatment to replace current ones that are delivered largely through ‘one-size-fits-all’ approaches.

A doctor administers a drug or a dosage to a patient based on the findings of large clinical trials. However, these often work better for some patients than others, depending on factors like the stage and type of cancer.

A small number of drugs are compared in trials, and the dosage is almost or at a second drug is used as a substitute.

A team of scientists from the National University of Singapore (NUS) has come up with a way to test whether individual patients have tumours that need a different drug or dosage.

“The aim is to give the right drug, to the right patient, at the right time and right dosage,” said Professor Lim Chwee Teck, principal investigator of the Mechanobiology Institute, on the team’s work.

“Studies have shown that tumours that are sensitive to a drug can grow more slowly than ones that are resistant to the drug. But if it does not, then the dosage is altered or a second drug is used in combination with the first drug. The advantage is that you can tailor the treatment,” said Professor Khoo Bee Luan, senior postdoctoral associate at the Singapore-MIT Alliance for Research and Technology, in an NUS laboratory with their research projects.

How it is done

1. Blood is extracted from the patient. Just 750ml of blood is needed, which is about 1½ teaspoons.

2. The cancer cells and white blood cells are separated from red blood cells, plasma and platelets. The remainder of the sample, comprising more than 80 per cent of lung cancers here.

3. The research team from the Mechanobiology Institute, led by Professor Lim, co-led the NUS research.

4. They zoomed in on the genes that could be used to predict how well patients with the cancer will respond to the treatment.

5. They are more effective and less time-consuming.

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9. The idea, said Prof Lim, is to grow tumour clusters in a device that mimics the conditions inside the human body.

10. Once the tumour clusters have formed, they are placed in an incubator. Tumour clusters are inserted into microwells.

11. A drug or a combination of drugs is then placed in the device to test whether the tumour will respond to the treatment. The results can be analysed in two days.

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