Tailoring treatment for cancer patients

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

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Scientists have a step closer to developing cancer treatments suit- ed for individual patients, which are more effective and time-saving.

Their dream is to have a stock of tumour tissue slices that are delivered directly to patients, without the need for expensive, lengthy and invasive operations. In a historic achievement, researchers at the National University of Singapore (NUS) have come up with a way to label all the proteins outside of the cell body — including those hidden inside or on the surface — and then testing drugs on them.

The process enables the first screening of drug treatments on cancer tissues that are likely to be further amplified in the laboratory, according to Prof. Luan (Crown) Tuck, principal investigator at the Rockefeller Institute in Singapore and principal investigator at the NUS-MIT Alliance for Research and Technol- ogy. Dr. Khan conducted the research in collaboration with the NUS-MIT Alliance.

Growing tumours in tiny wells

Scientists from the National University of Singapore have developed a device which can grow cancer cells extracted from the blood of patients into tumour clasters, and allows drugs to be tested on these tumours in different dosages and combinations. Eventually, the device could help doctors to come up with treatment customised for individual patients.

How it is done

1. Blood is recovered from the patient. Just 72ml of blood is needed, which is about 5% of the patient's blood volume.

2. Circulating tumour cells — cancer cells that have broken away from the patient's cancer tumour — are separated from red blood cells, plasma and patients.

3. The device is then placed in an adequate Tumour clasters are formed within two weeks.

Using genetic data to predict outcomes

After studying the genetic data of tumours from thousands of early-stage lung cancer patients in Singapore, researchers have found 24 genes that could be used as a predictor for how well patients with the cancer will respond to chemotherapy.

These genes could also be potential therapeutic targets.

The research team from the National University of Singa- pore and cardio-oncology specialist at the Singapore General Hospital Dr. Min Lee, are now working on a new generation of cancer treatments that can selectively target new biomarkers.

"This project is a great success, as it allows us to discover new targets for treatment," said Prof. Luan Tuck.