



 Cancer survivor Melissa Monk Clarke sees benefits from a biobank of organoids. Picture Yuri Kouzmin

VIC News

New treatment involving ‘mini-guts’ could help doctors determine the best way to destroy tumours

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A NEW biobank of ‘mini-guts’ will help doctors determine the best way to destroy tumours and which cancer patients can be spared invasive surgery within the next 12 months.

The tiny organs — just 2mm in size — are grown from tumours removed from Victorian patients, becoming “miniature laboratories” that can help personalise

treatment and progress the development of new drugs.

With an infinite lifespan, these tiny balls of cells — known as organoids — are grown in a dish and mimic the features and functions of the tissue they are taken from.

So far 30 ‘mini-guts’ have been grown in the Biomedicine Discovery Institute at Monash University opening in Melbourne today. (MON)

Lead researcher Associate Professor Helen Abud said the organoids in the living biobank of tissue are being used to test and validate new drugs.

They will also take the guesswork out of treatment by helping doctors determine which drug to use, the dosage and whether follow up surgery is necessary.

“We are testing the response of individual organoids against a panel of drugs currently used in the clinic and trialling potential new treatments to see how effective they are in stopping the cancer growth,” Associate Prof Abud said.

“The ultimate aim is to use organoids as a clinical drug test that would provide a guide to treating oncologists as to the best choice of drugs for each patient.”



📷 Monash University lead researcher Helen Abud. Picture: Kylie Else

Within 12 months the partnership between Monash University and Cabrini Hospital will turn bowel cancer patient's tumours into organoids in real-time to inform patient's treatment plans.

Head of the Cabrini Monash Department of Surgery Associate Professor Paul McMurrick said in the same way each human is unique, so too are their tumours.

"There is a relatively narrow group of chemotherapy drugs available to treat bowel cancer and we never quite known which patients will respond to the treatments."

In addition, he said around 15 per cent patients respond to chemotherapy and radiation and don't require follow up surgery, but it's unclear which patients fit this category.

"We would like to do is use the window of time in between treatments, usually 3-4 weeks, to test in the organoid whether the tumour is sensitive to chemotherapy and, if so, which types," Associate Prof McMurrick said.

If they can demonstrate the organoid's behaviour mimics patient's cancers response to treatment it would be a "game-changer."

The team will work with other scientists and clinicians in the Australian Living Organoid Alliance, expanding their work into breast, prostate and gastric cancers.

Melissa Monk Clarke had surgery and chemotherapy to eradicate her bowel cancer at the age of 34, but worries it will reoccur and about the future risk to her children.

"For me, the development of an organoids biobank to deliver personalised bowel cancer treatment is revolutionary," she said.

Mini-guts/organoids: How it works

- Small amounts of normal and cancerous tissue are taken from the bowel during surgery
- The tissue is broken up and the cells are placed in a three-dimensional culture where they replicate, forming organoids 2mm in diameter
- These organoids — also known as mini-guts — do not look like organs but they contain all the same DNA and tissue structures that the tumour had

- Scientists place chemotherapy drugs into a plate with wells containing the mini-organs and see how they respond
- This information is relayed to the oncologist so they can decide which drugs to use and whether the patient needs further surgery

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