

New tools detect serious gut conditions

May 9 2017, by Tess Redgrave

Researchers at [FlexiMap](#), a spin-out company from the University of Auckland's Bioengineering Institute (ABI), are developing tools that will revolutionise our understanding of the stomach and intestine by measuring its bioelectrical activity.

Based at the Institute and with some 12 researchers on board, FlexiMap is already leading the world in commercialising FPC mapping electrodes that surgeons can use intra-operatively to measure what's going on inside a patient's stomach and intestines.

"We have embedded a copper circuit with contact electrodes at the end onto a flexible polymer patch which can be placed on the surface of a patient's stomach to measure bioelectrical activity," explains FlexiMap's Lead Engineer and Director, Dr Peng Du.

Each of these patches contains 32 recording channels relaying waves of gastrointestinal bioelectrical activity to a computer in a similar way an electro-cardiogram measures heart function.

"We can use eight patches on the outside of a patient's stomach at a time so that's 256 channels," explains Dr Du. "This enables the surgeon to see the propagation of bioelectrical activity in the gut by going from one electrode to the next. The surgeon can see how fast the activity moves, how strong the signal is and from this information, they can tell whether there is an abnormality going on."

In particular the [electrode](#) is being used to detect two conditions. The

first is called gastroparesis which is when pacemaker cells in the stomach no longer function at all and the [stomach](#) loses its bioelectrical activity. This can be a very serious condition which can lead to serious malnutrition.

The second condition is called chronic unexplained nausea and vomiting, the name of which describes its unpleasant symptoms. FlexiMap was the first to accurately diagnose this disease with bioelectrical recordings.

"Traditionally it's thought you either have this disease or not, but we have discovered by using the FPC mapping electrodes that people can be on a spectrum with this disease and surgeons can use it to determine where someone is on the spectrum," says Dr Du.

The FPC electrodes have already undergone human clinical trials in New Zealand and the United States and are now being sold to academic institutions aligned to hospitals in the US and China.

The ultimate goal of FlexiMap is to develop a non-invasive and routinely applicable package for gastro-intestinal analysis.

Says Dr Du: "This will mean people will be able to go to their doctor and just as they have a routine examination on things like blood pressure, for example, the health of their gut will be easily checked."

Provided by University of Auckland

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