Potential treatment for a specific kind of pancreatic cancer

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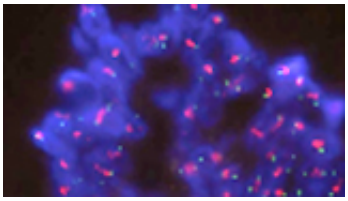

Photo of a tissue sample stained (red) to highlight the HER2 gene.

Australian researchers have identified a potentially treatable subtype of pancreatic cancer, which accounts for about 2% of new cases. This subtype expresses high levels of the HER2 gene. HER2-amplified breast and gastric cancers are currently treated with Herceptin.

Pancreatic cancer is the fourth leading cause of cause of cancer death in Western societies, with a 5-year survival rate of less than 5%. It is a molecularly diverse disease, meaning that each tumour will respond only to specific treatments that target its unique molecular make-up.

A new study, published in *Genome Medicine*, used a combination of modern genetics and traditional pathology to estimate the prevalence of HER2-amplified pancreatic cancer. Pancreatic surgeon Professor Andrew Biankin, from Sydney's Garvan Institute of Medical Research and the Wolfson Wohl Cancer Research Centre at the University of Glasgow, worked with pathologist Dr Angela Chou and bioinformatician

Dr Mark Cowley from Garvan, as well as cancer genomics specialist Dr Nicola Waddell from the Queensland Centre for Medical Genomics at the University of Queensland.

Using data sourced from the Australian Pancreatic Cancer Genome Initiative (APGI), the team identified a patient with high-level HER2 amplification. Using whole genome DNA sequencing of the tumour, Dr Nicola Waddell pinpointed the specific region of the genome that contains HER2.

Dr Angela Chou then performed detailed histopathological characterisation of HER2 protein in tissue samples taken in the past from 469 pancreatic cancer patients. This produced a set of standardised laboratory testing guidelines for testing HER2 in pancreatic cancer, and showed the frequency of HER2 amplified pancreatic cancer of 2.1%.

Dr Chou also found that - like HER2-amplified breast cancer patients - the cancers of those with HER2-amplification in the pancreas tended to spread to the brain and lung, rather than the norm, which is the liver.

Dr Mark Cowley analysed all the data generated by the project and compared it to other sequences from many cancer types produced by the International Cancer Genome Consortium and The Cancer Genome Atlas project. "HER2 amplification was prevalent at just over 2% frequency in 11 different cancers," he observed.

"We make the case that if HER2 is such a strong molecular feature of several cancers, then perhaps recruiting patients to clinical trials on the basis of the molecular features rather than the anatomical region of their cancer could have a significant impact on patient outcomes, and still make economic sense for pharmaceutical companies."

"Such 'Basket trials' as they are sometimes called, may advance

treatment options for those with less common cancer types."

In Australia, 2,000 people are diagnosed with pancreatic cancer each year, and so 40 are likely to have the HER2 amplified form.

While Herceptin is available through the Pharmaceutical Benefits Scheme for treating breast and gastric cancer, it is not available for treating HER2-amplified pancreatic cancer as no clinical trial has yet been conducted to determine the drug's efficacy in that case.

The Garvan Institute in collaboration with the Australasian Gastro-Intestinal Trials Group, is recruiting pancreatic cancer patients through the APGI for a pilot clinical trial, known as 'IMPaCT', to test personalised medicine strategies.

Potential patients will be screened for specific genetic characteristics, including high levels of HER2, based on their biological material sequenced as part of the APGI study. Once these characteristics are confirmed, patients will be randomised to receive standard therapy or a personalised therapy based on their unique genetic make-up.

More information: genomemedicine.com/content/5/8/78/abstract

Provided by Garvan Institute

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