Promising new approach to help monitor children with brain cancer

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Doctors may soon be able to better monitor brain cancer in children and potentially predict the tumour progress and therapy response, thanks to University of Queensland-led research, funded by the Children's Hospital Foundation.

Dr Marija Kojic (https://frazer.uq.edu.au/profile/4380/marija-kojic), from UQ's Frazer Institute, said the team investigated the use of patient-specific screening tests to improve the accuracy of an emerging surveillance method called liquid biopsy, with encouraging initial results.

"Liquid biopsy screens body fluids for the presence of circulating tumour DNA to monitor and detect changes over the course of the disease," Dr Kojic explained.

"However, its efficiency and reliability in detecting the much lower number of mutated genes present in paediatric brain cancer relative to adult and other cancer types is preventing its use in the clinic.

"We set out to improve those shortcomings by making the personalised screening method even more personalised for the patient.

"Our approach uses whole-genome sequencing to firstly identify patient-specific somatic mutations, then a screening test specific for that patient is developed.

"In the initial small cohort study, we found it was more sensitive and had great potential as a tool for detecting and monitoring primary and metastatic paediatric brain cancer during treatment."

Brain cancer kills more Australian children every year than any other disease.

Since the establishment of radiation and chemotherapy approaches to treatment more than 30 years ago survival has not improved, so there is a desperate need for new approaches to both diagnosis and therapy.

Dr Kojic is part of a research team focused on understanding the genetic pathways underlying the development of medulloblastoma, the most common malignant brain cancer of children, led by Professor Brandon Wainwright.

This particular work was co-led with Dr Tim Hassall, Consultant Paediatric Neuro-Oncologist, Queensland Children's Hospital.

"This is an important finding because it will open up new avenues for personalised medicine for these young patients," Professor Wainwright said.

"Early detection and serial monitoring are essential for better therapeutic outcomes and this approach will help predict tumour progression, burden, and response to treatment."

Children's Hospital Foundation CEO, Lyndsey Rice said the Foundation is proud to help fund Dr Kojic's research, through its support of the Children's Brain Cancer Centre.

"The Children's Brain Cancer Centre unites the best of the best in paediatric brain cancer research to boost research capacity and outcomes in Queensland and beyond," Ms Rice said.

"We are proud to support the work of Dr Kojic at the Centre to help bring new hope to children diagnosed with brain cancer around the world."

The study is published in the Society for Neuro-Oncology journal, Neuro-Oncology.

It was a collaboration with the Queensland Children's Hospital, Queensland Children's Tumour Bank, Royal Children's Hospital and QIMR Berghofer.

The authors thank the patients and their families for their invaluable support.

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