A better diagnostic tool for brain cancer

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A joint study by researchers at the National Neuroscience Institute (NNI), National University of Singapore (NUS), and Singapore Institute for Clinical Sciences (SICS), A*STAR, has uncovered the role of a new tumour suppressor – known as parkin – in brain cancer that promises to shed insights into why certain brain tumours are more aggressive than others.

This multi-institutional collaborative work, led by Associate Professor Lim Kah Leong at the NUS Yong Loo Lin School of Medicine's Department of Physiology, and Dr Carol Tang, Research Scientist at NNI together with Associate Professor Ang Beng Ti, Consultant at the Department of Neurosurgery at NNI and Senior Principal Investigator at SICS, was published recently in the May 15 issue of *Cancer Research*, a leading international cancer journal.

Forming the majority of adult malignant brain tumours, gliomas affect a significant number of individuals globally, including here in Singapore. The NNI sees about 50 new cases of malignant glioma each year and continues to manage its existing glioma caseload by means of a multi-disciplinary neuro-oncology clinic. The prognosis for the majority of these tumours remains grim, particularly for patients with glioblastoma multiforme (GBM), the most aggressive form of brain tumour. The late Senator Edward Kennedy was reportedly afflicted with this malignant form of glioma. Senator Kennedy died 15 months after his diagnosis. For reasons yet unclear, others readily succumbed to the disease within a much shorter time. Interestingly, the study showed that the level of parkin expression in glioma cells can determine the survival outcome

and disease progression of patients, i.e. those who have high parkin expression in their cancer cells tend to survive longer with lower tumor grades than their parkin-deficient counterparts.

“With this understanding, instead of generalising malignant brain cancer patients, we can now differentiate their tumours based on their molecular characteristics” commented A/Prof Lim and Dr Tang. Agreeing, A/Prof Ang added, “This is significant as the stratification would allow us to formulate the most appropriate treatment for each patient.”

Importantly, the investigators also found that the restoration of parkin expression in parkin-deficient cells can slow down their proliferation rate and decrease their tumour size significantly. They are currently testing drugs that can mimic parkin’s protective function against the aggression of brain tumours.

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Other key authors of the study are Mr Yeo Wee Sing, a graduate student at NUS Department of Physiology and Ms Felicia Ng, a bioinformatician previously at the Singapore Institute for Clinical Sciences, A*STAR.

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