Scientists identify biomarker for progression and drug response in brain cancer

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Scientists at the Icahn School of Medicine at Mount Sinai, Sema4, and collaborating institutions including Colorado State University and Fred Hutchinson Cancer Center reported results today from a glioblastoma study in which they validated a biomarker indicative of a patient's prognosis and likely response to specific therapies. The article appeared in the October 15 issue of *Cancer Research*.

Glioblastoma is a highly aggressive and heterogeneous form of brain cancer, with a median survival time from diagnosis of just one year. Previous efforts to classify glioblastoma tumors into molecular subtypes for precision treatment have been largely unsuccessful. In this study, scientists developed an innovative computational method to classify tumors based on their dependency on a molecule, known as BUB1B, that some glioblastomas need to survive. The project revealed new tumor subtypes and found that BUB1B-sensitive tumors had significantly worse prognosis but were more likely to respond to many drugs already in clinical use.

"It was truly remarkable to see our predictive model yield a new set of molecular subtypes, which appear to be far more indicative of prognosis and therapeutic response than existing subtypes," said Jun Zhu, PhD, Head of Data Sciences at Sema4, Professor of Genetics and Genomic Sciences at Mount Sinai, and senior author of the paper. "For patients who receive the grim diagnosis of glioblastoma, this signals new hope for tailored treatment more likely to be effective against their cancer."

"This research is an outstanding example of how theoreticians working with complex datasets, and clinicians on the frontlines of patient care, can collaborate to uncover new insights into cancer biology that will directly impact clinical decision-making," said Raymund Yong, MD, Assistant Professor of Neurosurgery and Assistant Professor of Oncological Sciences at the Icahn School of Medicine at Mount Sinai, who made a significant contribution to tumor samples, glioma stem cells, and in vitro experiments in the paper.

Eric Schadt, PhD, Sema4 CEO and Dean for Precision Medicine at Mount Sinai, added: "These findings underscore the significant potential we see to improve patient outcomes by investing in predictive modeling of even the most complex types of cancer. We look forward to building on this collaborative project and moving toward development of a diagnostic test that could help physicians better understand and treat their patients' glioblastoma cases."

More information: Eunjee Lee et al. Sensitivity to BUB1B Inhibition Defines an Alternative Classification of Glioblastoma, *Cancer Research* (2017). DOI: 10.1158/0008-5472.CAN-17-0736

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