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Researchers identify critical genes responsible for brain tumor growth

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After generating new brain tumor models, Cedars-Sinai scientists in the Board of Governors Regenerative Medicine Institute identified the role of a family of genes underlying tumor growth in a wide spectrum of high grade brain tumors.

"With these new genetic findings, our group of researchers plan to develop targeted therapeutics that we hope will one day be used treat patients with high grade brain tumors and increase their survival," said Joshua Breunig, PhD, a research scientist in the Brain Program at the Cedars-Sinai Board of Governors Regenerative Medicine Institute and lead author of the research study published in the journal *Cell Reports*.

High grade brain tumors, known as gliomas, are difficult to treat with only a single digit five-year survival rate. Most patients treated for primary gliomas develop into secondary gliomas, which are almost always fatal.

"Any given tumor can harbor a variety of different combinations of mutations," said Moise Danielpour, MD, Vera and Paul Guerin Family Chair in Pediatric Neurosurgery, director of the Pediatric Neurosurgery Program and the Center for Pediatric Neurosciences in the Maxine Dunitz Children's Health Center and last author on the study. "Despite advances in radiation and chemotherapy, there are currently no effective curative regimens for treatment for these diverse tumors."

Researchers first modeled high grade brain tumors from resident stem

cells inside the brain, using a cutting edge method of rapid modeling that can create up to five distinct tumor models within 45 minutes.

After effectively modeling high grade brain tumors, researchers identified the Ets family of genes as contributors to glioma brain tumors. These Ets factors function to regulate the behavior of tumor cells by controlling expression of genes necessary for tumor growth and cell fate. When expression of the Ets genes is blocked, researchers can identify and strategize novel treatment therapies.

"The ability to rapidly model unique combinations of driver mutations from a patient's tumor enhances our quest to create patient-specific animal models of human brain tumors," added Danielpour.

Immediate next steps involve testing the function of each individual Ets factor to determine their specific role in tumor progression and recurrence after treatment.

More information: *Cell Reports*: 2015 July: Ets factors regulate neural stem cell depletion and gliogenesis in Ras pathway-driven glioma. www.sciencedirect.com/science/ … ii/S2211124715006105

Provided by Cedars-Sinai Medical Center