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Cell signaling key to stopping growth and migration of brain cancer cells

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Brain cancer is hard to treat: it's not only strong enough to resist most chemotherapies, but also nimble enough to migrate away from radiation or surgery to regrow elsewhere.

New research at the University of Colorado Cancer Center shows how to stop both.

Specifically, cells signal themselves to survive, grow, reproduce, and migrate. Two years ago, researchers at the CU Cancer Center showed that turning off a family of signals made brain cancer cells less robust – it sensitized these previously resistant cells to chemotherapy.

But the second major problem – migration – potentially remained.

"I thought, aha, I have this great way to treat this cancer, but needed to check that we weren't going to cause other problems. We wondered if turning off TAM family signaling would make brain cancer cells crawl away to a new spot where they might make new problems," says Amy Keating, MD, investigator at the CU Cancer Center and senior author of the study, recently published in the journal *Nature: Oncogene*.

So Keating and colleagues went inside this TAM signaling family to explore how its members affect not only proliferation but migration. When they inhibited signaling through the other family member Axl, little changed (actually this was good: at least turning off this signaling pathway didn't promote cancer cell migration).

But when Keating and colleagues turned off signaling through the Mer pathway, it was neither too hot nor too cold – it was just right, and these affected cancer cells were not only more sensitive to chemotherapy, but also unable to escape to safer areas of the brain.

Currently glioblastoma multiforme affects 45,000 people in the United States every year, the majority of whom will not survive 14 months after diagnosis.

"This represents a new targeted therapy, offering a potential new direction that nobody's tried before," says Keating, assistant professor of pediatrics at the University of Colorado School of Medicine.

After these extremely promising results with cell lines, Keating and colleagues are currently testing the technology in mice, after which all involved hope to move soon to human clinical trials.

Provided by University of Colorado Denver

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