A New Door Opens for Brain Cancer Treatment

For the first time, researchers have been able to convert skin cells into cancer-killing stem cells—opening the door to new treatments for brain cancer.

The advance, by University of North Carolina at Chapel Hill pharmacy researchers, is being hailed as a breakthrough in stem-cell research and cancer treatment.

The technique, reported in *Nature Communications*, could offer the first new line of treatment for the brain cancer known as glioblastoma in more than 30 years, and holds the promise of being the most effective therapy against the often-fatal disease.

“Patients desperately need a better standard of care,” said Shawn Hingtgen, an assistant professor in the UNC Eshelman School of Pharmacy and member of the Lineberger Comprehensive Care Center and who led the study.

The work builds on a Nobel Prize-winning technology, which allows researchers to turn skin cells into embryonic-like stem cells.

Only about 30 percent of glioblastoma patients live more than two years after diagnosis because it is so difficult to treat. Even when such tumors can be removed surgically, the invasive, cancerous tendrils that spread deeper into the brain are usually impossible to reach.

As a result, most patients die within a year and a half of their diagnosis.

But Hingtgen and his team have developed a new personalized treatment for glioblastoma that starts with a patient’s own

skin cells, with the goal of getting rid of the cancerous tendrils and effectively killing the glioblastoma.

The technique involves reprogramming skin cells known as fibroblasts to become brain stem cells. Working with mice, Hingtgen's team showed that these neural stem cells can hone in on cancer cells and kill them.

The researchers now plan to focus on human stem cells and test more effective anti-cancer drugs that can be loaded into the tumor-seeking neural stem cells.

"Our work represents the newest evolution of the stem-cell technology that won the Nobel Prize in 2012," Hingtgen said. "We wanted to find out if these induced neural stem cells would home in on cancer cells and whether they could be used to deliver a therapeutic agent. This is the first time this direct reprogramming technology has been used to treat cancer." {eoa}

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