Treating mouse tumors with microglia

A new method for deriving microglial cells from induced pluripotent stem cells holds hope for treating brain tumors.

Glioblastoma is the most common brain tumor, and one of the most lethal—median survival time after diagnosis is about a year. John Park, a neurosurgeon and scientist at the National Institutes of Health, and colleagues present work in *Nature Neuroscience* that they hope will one day help combat this disease (*Nat. Neurosci.* doi:10.1038/nn.4534; published online 2 March 2017).

“My PhD is actually in immunology”, comments Park, “so when I wanted to find projects to try and come up with a treatment for brain tumors, I thought I’d draw on my immunology background to develop an immunotherapy.” Microglial, which are the immune cells of the brain, seem like an obvious starting point for immunotherapy for brain tumors, but they’re difficult to isolate. Unlike other immune

iPS derived mouse microglia engraft and migrate to sites of pathology. Cells stained for various markers of tumors (Luciferase) and endogenous (Iba1) as well as engrafted (GFP) microglia.

cell types, like dendritic cells which can be easily isolate from peripheral blood, acquiring microglial would involve highly invasive procedures, which would not be clinically tractable.

Park and his team applied induced pluripotent stem cell (iPSC) technology to generate microglial-like cells, enabling them to produce a robust source of the cell type for testing *in vivo*. Their results demonstrate not only the ability of these iPSC-

derived microglia to incorporate into the brains of a murine model of glioblastoma, but microglia-treated mice had significantly extended survival times, indicating the clinical potential of their method.

Park hopes that as iPSC technology continues to develop, application of patient-derived microglia could become a feasible treatment option, helping to tame an otherwise vicious disease.

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