Study in mice shows mechanisms behind immune responses to brain tumors

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Findings from a study conducted in mice, published in the open access journal *PLoS Medicine* next week, provide new insights into how an effective immune response to brain tumors could potentially be brought about in humans.

Maria Castro, of the Cedars Sinai Medical Center in Los Angeles, and colleagues tested a new combined treatment strategy designed to encourage the immune system to respond and kill tumor cells from a particularly aggressive cancer called glioblastoma multiforme (GBM). GBM accounts for a fifth of all primary brain tumors and only one in twenty people survives for more than five years after being diagnosed with it. Therapies that have been tried with the goal of inducing an immune response against GBM have been unsuccessful in the past, partly because the brain contains few dendritic cells - immune cells which recognise tumor antigens and present them to other cells in the immune system.

In this study, after establishing brain tumors in mice, the researchers injected two harmless viruses into the tumors. One of these viruses successfully attracted dendritic cells into the brain; the other, in combination with a drug which was delivered systemically, killed tumor cells, causing the release of a protein, high-mobility-group box 1, from dying tumor cells. This ultimately allowed the immune system to identify and eliminate the tumor.

It should be stressed that results from mice studies do not always lead to

effective treatments for human patients. However, the results from this study do provide compelling evidence to support the view that the combination of immunotherapy and strategies to kill tumor cells may eventually provide effective treatment for GBM and other brain tumors in humans. The combination therapy used in this study will be tested in clinical trials for the treatment of GBM in the near future.

Citation: Curtin JF, Liu N, Candolfi M, Xiong W, Assi H, et al. (2009) HMGB1 mediates endogenous TLR2 activation and brain tumor regression. PLoS Med 6(1): e1000010. doi:10.1371/journal.pmed.1000010
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