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Editorial

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Brain Tumor Treatment Development

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Editorial

Substantial advances in the molecular biology of brain tumors have occurred over the past several years. Recent new avenues regarding the role of microRNAs along with further understanding of the importance of angiogenesis, immunotherapy, and explanations for the resistance of the tumors to radiation therapy have been developed. Some improvements in surgical management issues including improvements in imaging along with issues concerning tumor induced epilepsy have been explored. In addition, previous histologic classifications of brain tumors have been modified to enhance the development of more effective treatment strategies [1]. Currently gliomas are classified into three types as follows: astrocytoma, Isocitrate Dehydrogenase (IDH) mutant; oligodendroglioma, IDH mutant and 1p/19q co-deleted; and glioblastoma, IDH wild type.

Antigenic differences between normal and malignant cells of the cancer patient form the rationale for clinical immunotherapeutic strategies. While the central nervous system has traditionally been thought of as an immune-privileged site, several studies have been conducted that demonstrate the potential efficacy of immunotherapy in management of primary and secondary brain tumors. In addition, work has been done involving regulation of immune checkpoint inhibitors which can block molecules involved in inhibiting immune cells that can result in a stimulation of the T-cell response against various tumors including brain tumors. Immune checkpoint inhibitors targeting pathways such as PD-1 and CTLA-4 may enhance T-cell-mediated anti-tumor responses and represent promising therapeutic strategies for selected brain tumors.

Glioma is a malignant brain tumor with a poor prognosis. Surgical resection is usually the first line of treatment. Additional treatment strategies including cranial irradiation and systemic or local chemotherapy each have serious adverse side effects and provide relatively minimal survival benefits. Cytokines such as IL-15 or IL-2 that stimulate an antitumor immune response have been shown to have particularly high potential for use in immunotherapy against various tumors. Pre-clinical studies with either a poxvirus genetically engineered to secrete IL-15 or allogeneic fibroblasts engineered to

secrete IL-2 are shown to be an effective treatment strategy in prolonging survival in mice with malignant intracerebral tumors upon injection of the treatment cells into the brain [2-4]. Future studies using these treatment strategies in patients with intracerebral tumors are urgently needed.

The goal of cancer therapy is the elimination of every remaining tumor cell from the patient. It is unlikely that a single form of therapy will be capable of achieving this goal. It is hopeful that new strategies will be efficacious in the treatment of brain tumors which are resistant to most standard therapeutic approaches.

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