Glioma treatment

Molecularly-targeted therapy is a focus of glioma research.

Current standard treatment for glioma patients is surgical removal followed by radiotherapy and adjuvant chemotherapy. Due to therapeutic resistance and tumor recurrence, efforts are ongoing to identify the molecules that are fundamental to regulate the tumor progression and provide additional methods for individual treatment of glioma patients. By studying the initiation and maintenance of glioma, studies focused on the targets of tyrosine kinase receptors including EGFR, PDGFR and other crucial signal pathways such as PI3K/AKT and RAS/RAF/MAPK pathway. Furthermore, recent advances in targeting immunotherapy and stem cell therapy also brought numerous strategies to glioma treatment.

Evidence have shown that a recombinant adenoviral vector expressing human wild-type p53, granulocyte-macrophage colony-stimulating factor (GM-CSF), and B7-1 genes (BB-102) may have antitumor effects in vitro. In this study, we investigated the effects of BB-102-based vaccine on glioma in vivo. An animal model using nonobese diabetic/severe combined immunodeficiency (NOD/SCID) mice with human immune system was established. The mice were vaccinated with inactivated U251 glioma cells transduced with BB-102 or adenoviral vector expressing green fluorescence protein (Ad-GFP) as a control and followed by the challenge of live U251 glioma cells. Tumor growth and antitumor responses were measured. Data showed that mice vaccinated with BB-102 had significantly reduced local tumor growth compared to mice with Ad-GFP vaccination or the control group. Histopathological analysis displayed low tumor cell density and significant infiltration of human peripheral blood lymphocytes (HuPBLs) in the tumor tissues of mice transduced with BB-102. Immunohistochemical analysis showed that mutant p53 was not expressed in tumor tissues of mice with BB-102 vaccination, and the expression level of Ki67 was significantly lower in the tumor tissues of the BB-102 group than those in the Ad-GFP group or the control group. Further study demonstrated that mice with BB-102 vaccination had significantly increased total T cell numbers, total T cell proportion, CD4+ T cell proportion, and CD8+ T cell proportion in spleens, as well as higher value of IgG, IgA, and IgE in sera. These data suggest that the recombinant adenoviral vector expressing human wild-type p53, GM-CSF, and B7-1 genes could suppress glioma in NOD/SCID mice model and might be considered as a novel strategy for glioma therapy.

Treatment options depend on the type of glioma, and patient-specific factors such as location and size of the glioma, patient age, symptoms and neurological status. In addition, three molecular markers – 1p/19q co-deletion, O6-methylguanine methyltransferase (MGMT) promoter methylation and isocitrate dehydrogenase (IDH) 1/2 mutations – are known to have important diagnostic, prognostic and predictive (for treatment efficacy) roles in glioma treatment (for reviews see Tabatabai et al. 2010 and Leu et al.).

The therapeutic management and prognosis of cerebral gliomas depend on tumor type and grade, and on exact definition of boundary.
In glioma patients, a presumed eloquent location has been identified as a key variable influencing the treatment strategy.\(^8\)\(^9\)

**Surgery**

see [Glioma surgery](https://operativeneurosurgery.com/doku.php?id=glioma_treatment)


