GL261

Glioma 261 (GL261) is a frequently used murine glioma model. It was induced via intracranial injection of methylcholanthrene followed by serial intracranial and subcutaneous transplantations of tumor fragments into syngeneic C57BL/6 mice.

By the mid-1990s, multiple groups had established a permanent cell line from the tumor.

GL261 tumors resemble ependymoblastomas on histology but show many characteristics of glioblastoma phenotypes. They contain activating mutations of the K-ras as well as mutations of p53, resulting in high expression of c-myc. GL261 tumors also highly express MHC I, explaining their partial immunogenicity and have limited expression of MHC II, B7-1, and B7-2. The tumors are invasive, are not known to be metastatic, and do not spontaneously regress.

Other immunocompetent murine models used to study GBM include GL26, CT-2A, SMA-560, and 4C8.

In a study of Tao et al. from the Neurosurgery Department, Yidu Central Hospital of Weifang , Qingzhou, Shandong Province, China, the mouse glioma cell GL261 was irradiated, and relative expression of TGFβ/Smad signaling genes was determined by real-time PCR and western blotting. The DNA repair response on exogenous TGF-β or LY2109761 was evaluated by quantification of diverse genes by real-time PCR and western blotting. Xenograft mice were employed for in vivo investigation to assess the response to irradiation and LY2109761 either alone or in combination. The expression of DNA repair genes was further determined in the xenograft tumor. The TGF-β/Smad signaling pathway was activated by radiation in the GL261 cell line. The exogenous complement of TGF-β significantly stimulated DNA repair response. Administration of LY2109761 suppressed DNA repair genes. Simultaneous treatment with LY2109761 abrogated the upregulation of DNA repair genes in GL261. In the xenograft tumor model, LY2109761 synergistically improved the therapeutic effect of radiation via improvement of sensitivity.

This data suggested that LY2109761 treatment re-sensitized glioma to radiation via antagonizing TGF-β/Smad-induced DNA repair [1)].

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Tao S, Liu M, Shen D, Zhang W, Wang T, Bai Y. TGF-β/Smads Signaling Affects Radiation Response and Prolongs Survival by Regulating DNA Repair Genes in Malignant Glioma. DNA Cell Biol. 2018 Sep 19. doi: 10.1089/dna.2018.4310. [Epub ahead of print] PubMed PMID: 30230914.