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MAIN FIELDS OF RESEARCH; ABSTRACT

The highly malignant glioblastoma brain tumors are characterized by a poor prognosis and a challenging phenotype for drug development. Although multimodal treatment, including surgery, radio- and chemotherapy is applied, the overall survival is just above one year. Numerous clinical trials have studied targeted therapies against commonly deregulated pathways, but an efficient drug is yet to be discovered. A subset of glioma tumor cells demonstrates stem-like properties; these cells are commonly referred to as glioma initiating cells (GIC).

These types of cells are pluripotent and can by definition initiate and recapitulate glioma growth in experimental animals *in vivo*. Furthermore, these cells are often resistant to conventional therapies. Interferon β (IFN-β) is an immunomodulatory molecule with anti-cancer properties. We have previously shown in our laboratory that IFN-β greatly reduces sphere-formation capability of GIC cells. It was also confirmed that IFN-β sensitized resistant GIC to the chemotherapeutic agent, temozolomide (TMZ). IFN-β treatment significantly prolonged survival in a xenograft model with GIC cells.

In the current project, we want to study the immunomodulatory effects of IFN-β. By using syngeneic mouse models, it is possible to grow glioma tumors in immunocompetent mice. Flow cytometry analysis will elucidate changes in immune cell recruitment and infiltration upon IFN-β treatment. Multicolor staining panels makes it possible to determine and quantify specific infiltrating immune cell populations. Moreover, we want to explore different treatments in combination with IFN-β, as there are indications that TMZ or radiotherapy can have synergistic effects with immunotherapies.

SPECIAL TECHNIQUES AND EQUIPMENT

Cell culture, CRISPR/Cas9, Orthotopic mouse glioma models, *in vitro* proliferation and cell death assays