Abstract

Glioblastoma multiforme (GBM) is the most aggressive type of primary brain tumor. Current treatment includes surgical resection with following radio/chemotherapy, but prognosis of patients remains poor with median survival only about 15 months. GBM is characteristic for necrotic regions, abnormal vascularization and strong immunosuppression. Dynamic interactions of cancer cells, immune cells and other stromal cells in the tumor microenvironment can promote tumor growth and progression.

Fibroblast activation protein α (FAP) is overexpressed by the cells in tumor tissue. FAP is important in angiogenesis, remodelation of extracellular matrix and immunomodulation in cancers. The role of FAP in the tumor microenvironment is the subject of recent research.

The aim of the thesis was to prepare a syngeneic mouse model of glioblastoma with and without FAP expression, implement and optimalize the dissociation method for GBM tumor tissue and detect a variety of infiltrated immune cell populations in the GBM microenvironment by flow cytometry.

Optimization of dissociation protocol for glioblastoma tissue was a crucial step for viable cell suspension required for cytometry study of immune cell populations. A combination of dissection by dissociator and enzymatic digestion with mild enzymes was found to be the most suitable method. Syngeneic mouse models of GBM C57BL/6J WT and C57BL/6J FAP-/- implanted intracranially with mouse glioma cells were successfully established and infiltrated immune cell populations were explored. This thesis is pilot study of FAP expression and GBM immunosuppression association. Better understanding of the role of FAP in tumor microenvironment is necessary for development of novel treatment strategies for GBM.