Inhibition of indoleamine 2,3-dioxygenase as an adjuvant treatment strategy for glioblastoma to increase the efficiency of DC-based immunotherapy

In the clinic our research group applies the dendritic cell-based vaccination strategy for patients with high-grade gliomas, a specific type of malignant brain tumors. The dendritic cells, made from the patient's own blood cells, are stimulated with death tumor cells from the patient and are then injected back into the body of the patients. The goal of this treatment is to stimulate the immune system of the patient so that it can recognize and kill the tumor cells. The tumor cells however have different smart strategies to hinder the immune response against the tumor. The tumor cells can for instance make proteins that can suppress the immune response of the body against the tumor. One of these proteins is the enzyme, called indoleamin 2, 3-dioxygenase (IDO). It is known that IDO is highly expressed in human glioma tissue and that this expression is correlated with a worse prognosis. In my PhD project I work with a mouse model for malignant brain tumors, the so-called GL261 model. In this model I try to inhibit IDO activity in the tumor cells to evaluate if this can prolong the survival of the animals. I will also combine this strategy with the DC vaccination therapy to improve the efficacy of the latter. In addition to the mouse model, I'm also measuring the activity of IDO in the serum that is collected from glioma patients at different time-points and from healthy control subjects. We can do this by a technique that is called high-performance liquid chromatography. This technique allows us to evaluate if the activity of IDO in the serum of glioma patients is higher compared to the control subjects and if measuring IDO in the serum can be used as a prognostic marker.