# Abstract

Gliomas are the most common type of primary tumors of the central nervous system. They are characterized by high heterogeneity, invasive behavior, and resistance to treatment. This thesis summarizes current knowledge about the glioma microenvironment, focusing on interactions with neural tissue, including neurons, glial cells, and their precursors. It has been demonstrated that gliomas exploit normal physiological processes of neural tissue, such as synaptic signaling and paracrine communication, to support their growth, invasion, and therapy resistance. Key molecular and cellular mechanisms contributing to the malignant progression of gliomas include the formation of electrochemical synapses between neurons and tumor cells, their mutual paracrine signaling, and the remodeling of the surrounding environment. The work describes the significance of selected neurotransmitters (glutamate, γ-aminobutyric acid) and paracrine factors (neuroligin-3, brain-derived neurotrophic factor) in tumorigenesis and brain tumor related epilepsy. These insights provide a foundation for identifying new therapeutic targets, some of which are specifically mentioned in this work.



**Keywords:** glioma, tumor microenvironment, neuron-to-glioma synapses, paracrine signaling, glutamate, neuroligin-3