

Expression of Nuclear Receptor Binding Protein 2 (NRBP2) in brain development and tumors

Groom Alemayehu

A common characteristic for brain tumors is their disruption of normal growth patterns, causing uncontrolled cell division and growth, invasiveness and distant spread. Patients diagnosed with brain tumor cancer such as glioma and medulloblastoma, which are frequent form of brain tumors, usually have poor prognosis, and currently there is no efficient therapy. Immature neural cells are derived from neural stem cells. Neural stem cells have the ability to self-renew and develop into any specific cell type of the brain. An increasing amount of evidence suggests that brain tumors arise from immature neural cells which have a disruption in their growth regulatory pathways. Therefore, understanding the factors involved in neural stem cell development increases our knowledge of mammalian brain and brain tumor development.

The gene nuclear receptor binding protein 2 (NRBP2) have been found to have increased expression during differentiation of neural stem cell/progenitor cells. It is expressed in various regions in developing brain, including cerebellum where medulloblastoma arise. The purpose of the project is to investigate the function of this gene. In my studies I found that a variety of patient samples derived from brain tumors showed expression of NRBP2, but its expression varied between the different tumors.

To get some cues on the function of NRBP2, I investigated its location in the cell. In both human embryonic kidney cells with high expression of NRBP2 and brain tumor cells, NRBP2 is only present in the cytoplasm but not in the nucleus.

To understand the function of NRBP2 it is important to identify the proteins it interacts with (its binding partners). An earlier study in my group identified four proteins as its binding partners in human embryonic kidney cells with high expression of NRBP2. In my work I used three out of these four; I confirmed two of them as binding partners. To further investigate the role of NRBP2 in brain tumor, I tried to detect whether one of these four proteins, also one subtype of the protein are recognized as binding partners of NRBP2 in brain tumors. Four different brain tumor cell lines derived from patients were used. However, no binding partners were identified in these brain tumor cell lines.

Degree project in biology, Master of science (2 years), 2012

Examensarbete I biologi 45 hp till masterexamen, 2012

Biology Education Centre and Department of Immunology, Genetics and Pathology, Uppsala University, Sweden

Supervisor: Karin Forsberg-Nilsson & Anqi Xiong