



### **Fund “Nauka” Project № 19025 Resume**

“Astrocytic heterogeneity and transcription factor ZBTB20 expression in glial cell subpopulations of human telencephalon”

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Astrocytes are brain glial cells that perform various functions in the Central Nervous System (CNS): Two major morphological types of astrocytes are known: fibrous, in the white matter and protoplasmic, in the gray matter. GFAP (glial fibrillary acidic protein) is a standard marker used to identify CNS astrocytes. Most of the data available about the morphology of the astrocytes has been obtained from experiments in rodents. However, studies in the primate brain suggest the existence of primate specific astrocyte features. For example, a study on the expression of CD44 (membrane protein and extracellular matrix receptor) classifies astrocytes into two main subtypes: CD44<sup>+</sup> with long processes and CD44<sup>+</sup> without long processes. Some of these cells express GFAP, while others do not. The latter, according to their morphology and immunohistochemical phenotype, have the characteristics of both protoplasmic and fibrous astrocytes, which suggest heterogeneity of the human astrocytes.

In this project, we plan to investigate the expression of transcription factor ZBTB20 in human brains. In adult brain, ZBTB20 is expressed in the hippocampal pyramidal neurons. However, evidence in mice suggests it is also expressed in cortical glia. We aim to investigate the cell types which express ZBTB20 in adult human cerebral cortex under normal conditions. To this aim, we shall investigate brain tissue from autopsies of deceased patients without evidence for neurological disease. Images obtained after immunofluorescence staining will be quantitatively evaluated and subjected to additional statistical analysis. With this study, we hope to shed additional light on the heterogeneity of the glial subpopulations in the human brain.

### **Key words**

Human telencephalon, astrocytes, heterogeneity, ZBTB20