DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Human brain is the most complex organ in our body. It is composed of neuronal cells called neurons and glia – supporting cells. One of the types of glia are astrocytes. They are big, star-shaped cells characterized by long processes contacting synapses and other types of glia cells e.g. oligodendrocytes. Proper activity of the brain depends on appropriate function of astrocytes. Studies carried out by researchers and physicians point out impairment in astrocyte development and their function in neurodegenerative disorders *e.g.* Alzheimer and Parkinson diseases.

Unfortunately, we are still far away from the understanding why astrocytes are impaired in these disorders. The reason is that we do not know the basis of the process of astrogenesis. Therefore, in the following project I am going to investigate the process of astrocyte development, differentiation and maturation to better understand what drives and regulates astrogenesis, but also what can disturb this process. The problem, which I want to solve, is what is the role of 4 transcription factors in astrocyte development. Transcription factors are specialized proteins, which bind to the DNA and induce expression of specific set of genes. For this I am going to use *in vitro* as well as *in vivo* studies using mice.

First, I am going to check how the level of these 4 transcription factors is changing during astrocyte specification, differentiation and maturation. To do this I will visualize expression of the mentioned transcription factors and different astrocyte genes, which are specific for different steps of astrogenesis. Second, I want to find out which of these 4 transcription factors are necessary for astrocyte growth and differentiation. To do this I will create a special strain of mice lacking genes coding investigated transcription factors only in astrocyte lineage cells. Results of this part of the project will let me understand if the investigated transcription factors are required for the process of astrogenesis.

Results of my studies might help to understand basis of the process of astrogenesis, what in the long run may help explain etiology of certain human brain disorders.