

# Fighting brain tumors

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Over the last century the scientists have been trying to investigate and understand the secrets of cancer in order to be able to find new drugs and ways of treatment. Cancer can be explained as the abnormal growth of cells that have turned from normal to malignant thus meaning that they cannot control their proliferation. Depending on the place of the body the tumor is formed, it can be more or less difficult to treat. The brain is a very complicated organ as well as being different in terms of cell content and conditions compared to the other parts of the body and cancer in the brain can be very dangerous. Brain tumors are among the most common types of childhood and adulthood cancers. They appear in different parts of the brain and can be anything from easy to treat to very serious. Mainly in children, which are still under development, brain tumors can be very diverse and aggressive at the same time. Therefore, as scientists and humans we have to investigate new and effective ways to treat these diseases.

When the cells turn from "good" to "bad", a huge number of changes occur and they grow without stopping. As the cells are "overworking" they produce proteins and other components in large amounts which under normal conditions are produced in small amounts only. In this study we want to further investigate the role of one enzyme, which has been found to be overexpressed in glioma but also in paediatric brain tumors and which is called "heparanase".

Heparanase is an enzyme, which is produced normally in the body meaning that it is useful for normal processes. This enzyme can be considered as "a pair of scissors" which cleaves the connection between the cells thus giving space to the cells to move and migrate. Under cancerous conditions, this process can be extremely dangerous since the cells can migrate and "jump away" to other parts of the brain and by extension cause metastasis. Moreover, this enzyme has been shown to have other functions, independent of its ability to "cut" the interspaces of the cells, which can be very advantageous for the tumor progression.

Our aim in this project was to find the ways this enzyme contributes to cancer progression in glioma and paediatric brain tumors since we believe that there may be as of yet unknown functions of this enzyme that can give us a clearer view of what actually happens during metastasis. Such an insight can help in blocking its capacity if we are able to find new and more effective drugs.

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