

Chasing cancer – A brain tumor research

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Cancer is a deadly disease. Huge numbers of researchers are currently working with an ambition to defeat it. This master degree project is a humble effort with the same idea in mind.

The basic problem with cancer is that its actual trigger and the functioning behind it are not fully understood, so it continues to be very difficult to diagnose or treat. This project focuses on brain tumors (glioblastoma), a very severe form of cancer for which there is no cure yet and tries to understand some of the underlying characteristics and how the cancer reacts to new anti-cancer drugs.

Novel drug-combinations (the drugs are: Rimcazole, Sertraline, Pterostilbene and Gefitinib) were tested on the tumor cells taken from patients suffering from glioblastoma to see whether this new treatment method is effective in stopping the growth of the cells. Proliferation, survival of the cells and the nature of the tumor were monitored after treatment with the drugs. It was observed that drug combinations Rimcazole-Sertraline, Rimcazole-Gefitinib were very effective in controlling glioblastoma cell proliferation and also in killing it. Pterostilbene on the other hand, was actually inducing proliferation, which was strange.

The second part of the project involves knocking down genes associated with glioblastoma. Gene expressions determine the functioning of the cell in which it is present. So when some gene expressions are switched off, or in other words, when knocked down, the cells might start to malfunction and die. But for a cell to die, that particular gene expression should be crucial for the cell survival. Here, it is examined whether the gene EFEMP2 is such a crucial gene that affects the survival of glioblastoma. This gene was chosen since two other genes related to it are heavily associated with glioblastoma and other types of cancers and moreover, EFEMP2 has never been studied in relation to this disease. When EFEMP2 was knocked down, there was a 22% decrease in the live cells which, when compared to another gene which is important for cellular functions, proved to be significant. However, this part of the project requires more experiments and proof.

To summarize, two novel drug combinations that are effective in restricting glioblastoma survival and proliferation were shortlisted and a gene which could potentially play a key role in glioblastoma functioning was explored. While more research data needs to be collected for both projects, the results presented here has definitely opened new possibilities to approach and treat glioblastoma, a cancer that still awaits a cure.

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