

New breakthrough in glioblastoma research

A new study funded by the Israel Cancer Association, the European Research Council (ERC) and the Kahn foundation, conducted by Prof. Ronit Satchi-Fainaro, Chair of the Department of Physiology and Pharmacology at the Sackler Faculty of Medicine, Head of the Cancer Angiogenesis and Nanomedicine Laboratory in Tel Aviv University, led to a breakthrough in glioblastoma research.

The study found that the balance of 7 genes in glioblastoma model systems could predict a significant prolongation in patients' lives. Glioblastoma is known to be a highly aggressive brain cancer. Despite all the treatments offered by modern medicine, 97% of patients die within 14 months of diagnosis, including many who die within a few months. However, the remaining 3 percent of those diagnosed may survive three years or more. In the new study, Prof. Ronit Satchi-Fainaro and her colleagues asked to examine what distinguishes the survivors from the rest of the patients.

In the study, Prof. Satchi-Fainaro's laboratory performed DNA and RNA genomic sequencing for samples taken from glioblastoma patients. The sequencing revealed a genomic pattern of seven genes, which was significantly different in patients who had survived for a long time, compared to the other patients. In other words, the proteins for which these genes are responsible were found to be deficient or in excess in patients who died within a short time.

In addition, the research, led by Dr. Galia Tiram and Shiran Ferber from the Satchi-Fainaro's laboratory, found that one of the proteins (P-selectin), which acts as a receptor, is overexpressed on the surface of glioblastoma cells and can be used as a target for specific nanoparticles that will selectively lead drugs to the tumor and prevent side effects in healthy tissues. An experiment with these nanoparticles in glioblastoma-bearing mice model showed that balancing two of these 7 proteins - by bringing them to a normal level through increasing their synthesis or blocking the gene responsible for their expression- significantly prolongs their survival.

Prof. Ronit Satchi-Fainaro emphasizes that “this treatment takes into account the entire genomic pattern, and that affecting a single gene is not enough. In the future, this study may serve as a basis for the development of an effective cocktail of drugs for this deadly disease and other cancers. Furthermore, based on these results, we developed materials

that would identify and fluorescently-label cancer cells that remained in tissue in real time, during surgical removal of the tumor”.

The research was just published in the scientific journal eLife.

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