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Israel uses genome editing to destroy cancer cells

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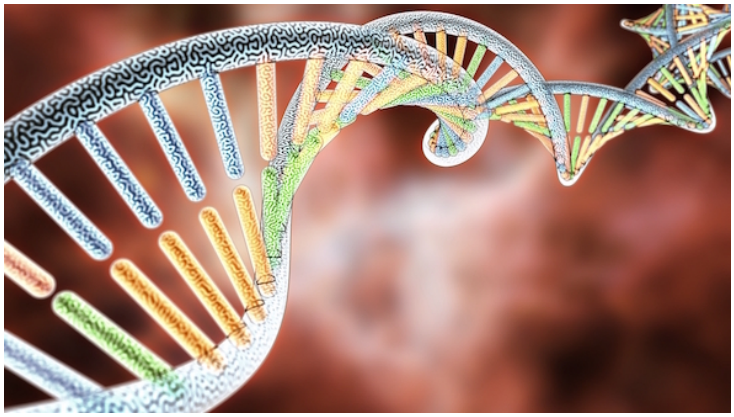

In a recent study, researchers at Tel Aviv University (TAU) in Israel have demonstrated that the CRISPR/Cas9 system is very effective in treating metastatic cancers- a significant step on the way to finding a cure for cancer. Funded by ICRF (Israel Cancer Research Fund), the results of the groundbreaking study, were published in November 2020 in Science Advances.

The researchers developed a novel lipid nanoparticle-based delivery system that specifically targets cancer cells and destroys them by genetic manipulation. The system, called CRISPR-LNPs, carries a genetic messenger (messenger RNA), which encodes for the CRISPR enzyme Cas9 that acts as molecular scissors that cut the cells' DNA.

"It must be emphasised that this is not chemotherapy. There are no side effects, and a cancer cell treated in this way will never become active again. The molecular scissors of Cas9 cut the cancer cell's DNA, thereby neutralising it and permanently preventing replication," said Prof Peer.

To examine the feasibility of using the technology to treat cancer, Prof Peer and his team chose two of the deadliest cancers: glioblastoma and metastatic ovarian cancer. Glioblastoma is the most aggressive type of brain cancer, with a life expectancy of 15 months after diagnosis and a five-year survival rate of only 3%. The researchers demonstrated that a single treatment with CRISPR-LNPs doubled the average life expectancy of mice with glioblastoma tumours, improving their overall survival rate by about 30%.

The researchers noted that by demonstrating its potential in treating two aggressive cancers, the technology opens numerous new possibilities for treating other types of cancer as well as rare genetic diseases and chronic viral diseases such as AIDS.