Cancer treatment changes cancer cells into normal ones

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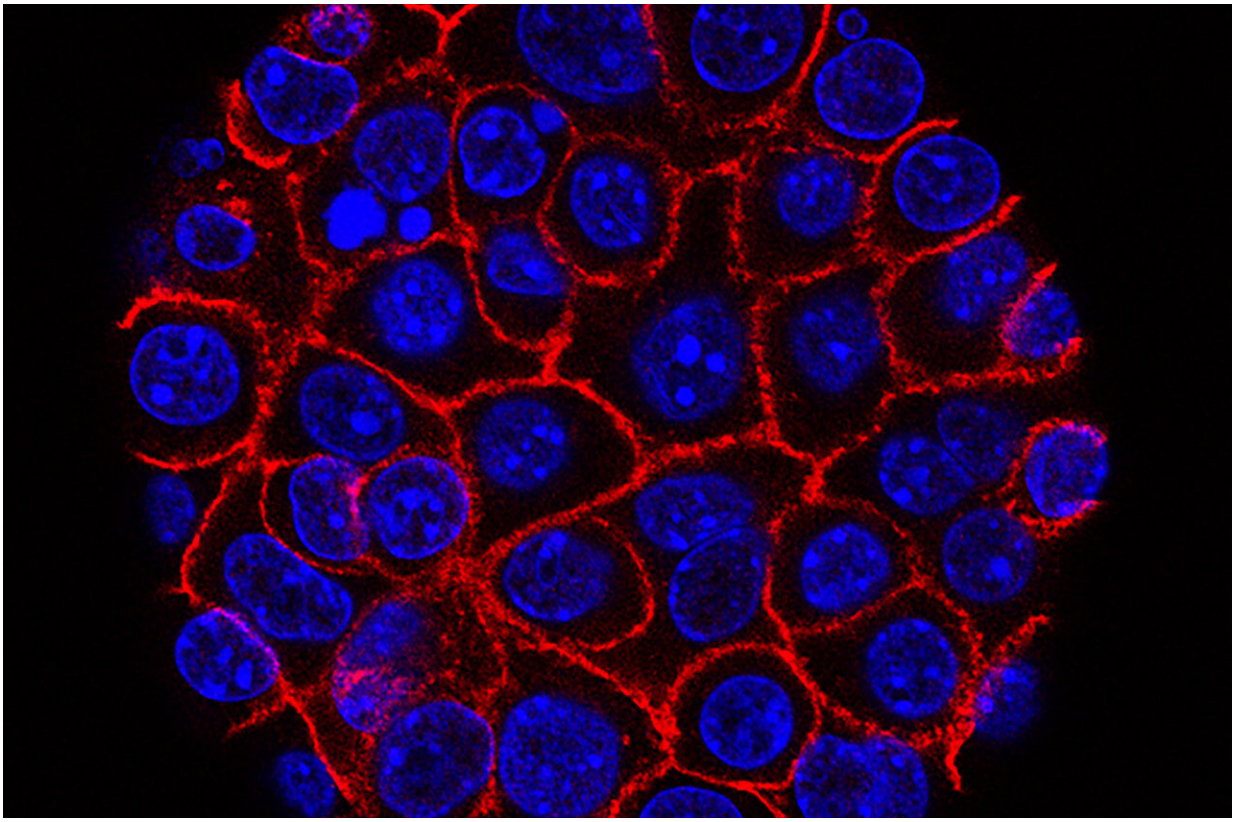

Credit: Min Yu (Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC),USC Norris Comprehensive Cancer Center

BGN Technologies, the technology-transfer company of Ben-Gurion University of the Negev (BGU), announced that a research group led by

Prof. Varda Shoshan-Barmatz of the BGU Department of Life Sciences and the National Institute for Biotechnology in the Negev, is developing a new molecule to treat cancer that inhibits cancer cell growth and changes these cells back to normal ones.

"Although this is in the early stages, we are excited with results that demonstrate this novel molecule's potential for cancer treatment," says Prof. Shoshan-Barmatz. "Basically, we've discovered a code for reprograming cancer cells that causes them to lose their oncogenic features."

The novel treatment is based on siRNA (small interfering ribonucleic acid), which silences expression of the mitochondrial gatekeeper protein, VDAC1. This protein is highly overexpressed in many solid and non-solid tumors and is crucial for supplying the high energy demands of malignant cells.

By silencing VDAC1, the researchers were able to inhibit cancerous cell growth. This offers potentially wide applicability, since treating the cells in a culture with the siRNA resulted in significant inhibition of cancerous cell growth without affecting noncancerous cells—an indication of a potentially safe treatment.

Prof. Shoshan-Barmatz has previously demonstrated that silencing VDAC1 expression using the siRNA method—a tool that temporarily silences protein coding genes—leads to inhibition of cancer cell growth both in vitro and in mouse models of glioblastoma lung cancer and triple negative breast cancer.

Treatment of cancer cells with VDAC1-specific siRNA also induces metabolic rewiring of the cancer cells, reversing their oncogenic properties and diverting them towards normal differentiated cells.

"Using the siRNA treatment for several types of cancer in mouse models reprogramed cancer cell metabolism, reduced tumor growth and angiogenesis, reduced tumor invasiveness, and induced cancer stem cell disappearance and cell differentiation," says Prof. Shoshan-Barmatz.

"We have patented the technology and are now seeking partners to further develop and advance this promising treatment in a clinical setting in the hope that it will lead to a novel path for cancer treatment," says Dr. Ora Horovitz, senior vice president of business development at BGN Technologies.

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