

Healthbeat Segment: Shaking Up Cancer

Scientists have discovered a new approach to fighting cancers that cannot be destroyed by radiation or chemotherapy.

It's a new twist on what's known as nanomedicine. It's an experimental therapy that does not involve drugs or heat. Instead, the cancer is outsmarted by simply being pushed around.

"It is a very devastating disease for which there is absolutely no cure," said Dr. Maciej Lesniak, neurosurgeon, University of Chicago Medical Center.

Malignant gliomas are cancerous brain tumors that kill thousands of Americans each year.

"No matter what we do these tumors tend to come back and grow," said Dr. Lesniak.

Chemotherapy radiation and surgery can buy patients some time but not for long. That's why neurosurgeon Maciej Lesniak and colleagues are so excited about some ultra tiny discs and an unlikely microscopic approach to killing off these stubborn cells.

"The approach, for lack of a better word, is very cool because we are trying to destroy these cancer cells through a mechanical process," said Dr. Lesniak.

During the process, the cancer cells are literally shaken by ultra tiny magnetic microdiscs which are clinging to the surface of the cancer.

So why is this significant?

In a unique partnership between the University of Chicago Medical Center and Argonne National Laboratory, scientists have discovered that this fairly gentle movement is enough to cause the cancer to self-destruct.

"They will tremble and this trembling will apparently produce very strong bio chemical effect that kills the cancer cell," said Valentyn Novosad, physicist, Argonne National Laboratory.

This approach is unusual because there are no toxic chemicals or dangerous heat involved.

So how do the discs know to find the cancer cells? They are treated with antibodies that help them attach to the cancerous glioma cells. And then, Argonne scientists say, the gentle destruction begins. When the discs are exposed to a very weak magnetic field about the same strength as a refrigerator magnet. They start to oscillate or move. It turns out the movement disrupts the cancer cell's membrane triggering a reaction in the cell telling it to die.

"Without side effects, without inflammation. So it's a very safe kind of cancer treatment," said Elena Rozhkova, PhD, biological chemist, Argonne National Laboratory.

In lab experiments the microdiscs destroyed up to 90 percent of cancers cells within about 10 minutes.

Researchers say surrounding healthy cells are not affected unlike other treatments such as chemotherapy and radiation.

"At least in these preliminary studies it really seemed to work and is very promising," said Dr. Lesniak.

Right now the treatment is far from being a reality for humans but Dr. Lesniak says unique approaches like these are the future. The disc could either be injected in a person or applied directly to a tumor during surgery.

"Maybe it's a little bit of a joke but I wouldn't completely rule it out that one day you could have your cell phone deliver a low power magnetic field to actually make his work and I think that's a very novel and very exciting and clearly promising," said Dr. Lesniak. Researchers not only have to prove that this can actually work on brain tumors, but they also have to make sure there are no harmful side effects.

This technique has been tried only on cells in a laboratory setting. The next step is testing in animals.

About the Author

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Imaginis Radiation Therapy for the Treatment of Breast Cancer

Side Effects

Types of Cancer

<http://abclocal.go.com/wls/sto...>

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