

Finding the Achilles' heel of cancer

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This is Prof. Malka Cohen-Armon of Tel Aviv University. Credit: AFTAU

A never-approved drug developed to prevent the death of nerve cells after a stroke can efficiently kill cancer cells while keeping normal cells healthy and intact, an international team led by a Tel Aviv University researcher is reporting in the journal *Breast Cancer Research*.

Prof. Malka Cohen-Armon of TAU's Sackler School of Medicine found that the stroke drug -- a member of a family of phenanthridine derivatives developed by an American drug company -- worked to kill cancer in mice which had been implanted with human breast cancer cells.

"Not only did the drug kill the cancer, but when we investigated normal cells, we discovered that they'd reacted as though they hadn't come in contact with the drug," says Prof. Cohen-Armon. "This is the result we were hoping for. If human trials go well, we could have an entirely new

class of drugs in our hands for the fight against cancer."

Stopping the deadly cycle of cancer cell growth

The immediate results of the study were only one of the promising findings in her research, she notes. The team also discovered a molecular mechanism in the cell cycle that can be arrested only in human cancer cells. This cell cycle arrest, they report, causes the cancer cells to die without affecting normal human cells.

"We've found a molecular triggering mechanism in cancer cells that, when set off, causes the cancer cells to die — they just stop multiplying and die within 48 to 72 hours. Normal, healthy body cells are only temporarily arrested by the same mechanism — they overcome this cell cycle arrest within 12 hours and continue to proliferate in the presence of the drug as normal un-treated cells," says Prof. Cohen-Armon. "All the human cancer cells we tested seemed to succumb to this compound."

She adds that, even if this particular drug doesn't reach the market to fight against cancer, an entirely new class of drugs might be built around mechanism the team has revealed.

Different strokes

The stroke drug was initially developed to prevent nerve cell death during inflammation and tissue damage in the brain after stroke. However, in pre-clinical studies, American researchers found that these compounds didn't work as well as they'd hoped. Today they are used only for research purposes in laboratory settings.

"The compound we used," says Prof. Cohen-Armon, "presented no traces of toxicity in mice. With this compound, we were able to show

how one of the many molecular mechanisms regulating the cell cycle can be targeted, and the proliferation of [cancer cells](#) halted." The team is currently working to identify all the regulatory mechanisms involved in this specific process and hope that, in better understanding the science, they might point the way to a new class of anti-cancer drugs.

Her research team was joined by Asher Kastiel, a Ph.D. student from Prof. Shai Izraeli's team working at the Chaim Sheba Medical Center, and the veterinarian Dr. David Castel. All the experiments conform with the Guide for the Care and Use of Laboratory Animals published by the National Institutes of Health in the United States.

Source: Tel Aviv University ([news](#) : [web](#))

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