

# THE TIMES OF ISRAEL

## Israeli start-up uses Trojan horse technology to kill cancer cells

BioSight has figured out a way to fool cancer cells into allowing themselves to be killed off – without harming normal cells

BY DAVID SHAMAH | October 26, 2015, 6:28 pm | 14

**B**ioSight, a medical technology start-up, has developed a technology that enables leukemia patients to avoid the worst effects of chemotherapy.

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"Our interim results in a major study of patients with leukemia shows that our system yields the maximum efficiency from chemo, with a minimum of toxicity," said Dr. Ruth Ben Yakar, CEO of BioSight. "Our method of using chemo does not cause brain damage or weaken blood cells," with all its attendant phenomena, such as lethargy, loss of hair, etc.

BioSight's "Trojan horse" chemo technology doesn't only work for leukemia patients, said Ben Yakar. "We believe it will be effective in many other kinds of cancer as well. It's a matter of finding the amino acid that a specific cancer is 'allergic' to, and packaging it in a structure that the cancer cell thinks contains material that strengthens it, while in reality it contains material that destroys it."



Doctors perform surgery at a hospital in Holon. (illustrative photo: Nati Shohat/Flash90)

The technology, said Ben Yakar, could become very important in the field of cancer treatment. "This really could be the cure for cancer."

BioSight was one of a dozen start-ups that presented their technology at the annual Go4Israel conference in Tel Aviv Monday. Considered one of the most important gatherings of international investors in Israel, the conference discussed issues relevant to investors and start-ups, including raising funds and establishing strategic alliances between corporate, entrepreneurs and investors from around the world. Companies presenting at the event included firms in high-tech, life sciences, renewable energy, and others. Among the investors was a large delegation from Europe – particularly France – and from China.

The Chinese presence in particular was noticeable, said conference chairman Edouard Cukierman, who heads the Cukierman & Co. Investment House and is Managing Partner of Catalyst Funds.

"With an increasing presence of Chinese investors at the Go4Israel conference, which are now the world leaders in investments in Israel, we can help open new global opportunities and create new relationships between entrepreneurs and international investors. Israel as a country and Israelis as business partners have a lot to offer worldwide."



Dr. Ruth Ben Yakar (Courtesy)

Investors from China, Europe, the US and elsewhere expressed particular interest in Ben Yakar's presentation at the conference. Chemotherapy – the use of anti-cancer drugs (chemotherapeutic agents) to fight cancer – is often the only medical course of action in fighting cancer. The problem is that the very strong attack chemicals have no way of differentiating between healthy and sick cells, so they attack all targeted cells.

While it's often the only way, nearly all doctors – like Ben Yakar, an expert in cancer therapies – will tell you that it is not the best way. "We have been able to develop a technology that targets only the cancerous cells, leaving the healthy ones alone," she said. "This way there is a lot less trauma to the body as a result of the therapy, enabling the patient to avoid the worst excesses of chemotherapy."

The BioSight solution targets AML (acute myeloid leukemia) and ALL (relapsed acute lymphoblastic leukemia), two of the most common type of the disease. The preferred treatment for both is cytarabine – a highly toxic drug with severe side effects including cerebellar toxicity and bone marrow suppression. However, the drug often cannot be used at all.

“While there is a perception that leukemia is a young person’s disease, it actually strikes the elderly much more often, and because of their advanced age, individuals 50 and over usually cannot tolerate chemotherapy,” said Ben Yakar. As a result, cytarabine’s toxicity significantly limits its use, resulting in a severe unmet medical need.

The solution, said Ben Yakar, is a drug developed by BioSight called Astrabine – a special form of cytarabine that contains an amino acid that is harmful to leukemia cells but not to normal cells.

Leukemia cells depend on an amino acid called asparagine, but they cannot synthesize it themselves, said Ben Yakar; as a result, they “steal” it where they can, from within the bloodstream.

“We set up a molecular structure that leukemia cells recognize as being associated with asparagine, which they need,” said Bar Yakar. “But instead we fill it with Astrabine, which kills them. Thus, using this Trojan horse trick, we are able to destroy the cancerous cells while preserving the healthy ones.”

The company – which developed the technology itself – is due to present the findings of its study next month at the annual meeting of the American Society of Hematology. “The results of the study were very satisfactory,” said Ben Yakar.

BioSight consulted with the US Food and Drug Administration on the study for treatment of newly diagnosed AML patients unfit for standard chemotherapy. The FDA and BioSight agreed regarding the study design, the company said.

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