

Israel Is Changing Medicine Forever

Adapted from an article by Shai Atanelov

Israeli ingenuity is responsible for some of the world's most amazing medical advances. Inventions are changing the face of healthcare in hospitals, doctors' offices, homes and even battlefields worldwide. Israel is in the top five countries in human infrastructure and entrepreneurship, first in the world for medical device patents per capita, and second in Europe for bio-pharma.

2015 has been a remarkable year for Israel when it comes to innovation in health and medicine. In the wake of humanitarian crises such as the [earthquake in Nepal](#), the [flooding in Myanmar](#), the [mudslide in Guatemala](#), the [tropical cyclone of Vanuatu](#), the [war in Syria](#) and even performing a [life-saving surgery](#) on the brother-in-law of Mahmoud Abbas, the medical assistance and humanitarian aid from the Israeli Army, along with numerous Israeli organizations such as IsraAID, were evident and pronounced.

Israeli scientists, researchers and startups had a remarkable year of medical breakthroughs in many medical sectors that will change our lives. This adapted article is devoted exclusively to advances in cancer treatment.

Cancer Treatments

Israel is at the forefront when it comes to developments in cancer treatments and research. From improved detection to targeted killings of cancer cells, Israel is proving that a cure for cancer may not be so far away. Eight significant advances are described below.

1. BioSight's Astrabine "Trojan Horse" Technology

[BioSight](#), a medical technology startup, has been able to develop a technology that targets only cancerous cells, leaving healthy ones alone. Astrabine closely resembles a protein called asparagine that leukemia cells depend on and the cancer cells are fooled into self-destruction. According to Dr. Ruth Ben Yakar this really could be the cure for cancer.

2. Vaxil's ImMucin Vaccine against 90% of Cancer Types

[Vaxil BioTherapeutics](#) has developed an immunotherapy vaccine that trains the immune system to attack cancerous cells. The vaccine is effective in the early stages of cancer detection and during remission. It will not help in the

advanced stages of cancer. Clinical trials have so far showed that ImMucin triggered a response in 90% of cancer types.

3. Predicting the Spread of Cancer

Most cancer-related deaths occur from metastases (secondary cancer) than by the primary tumor. Dr. Daphne Weihs, from Israel's Institute of Technology, developed a method to predict the spread of cancer from one organ to another. It will make it possible to act at a very early stage to identify and stop these metastases and prevent the primary tumor from metastasizing further.

4. Nanotechnology Against Killer Cancers

Glioblastoma multiforme (GBM) is one of the most aggressive and incurable forms of cancer. Professor Dan Peer of [Quiet Therapeutics](#) and his team at Tel Aviv University devised a technology using nanoparticles to transport drugs to target cancer sites while minimizing adverse effects. With Peer's nanotechnology, the drugs can be administered precisely to attack only the cancer cells, like a nanotech cancer bullet. The technology was tested successfully on ovarian cancer cells and is in the early stages of testing on brain tumors with promising results for the future.

5. Immunotherapy Cocktail to Cure Melanoma and Terminal Cancer

According to a study published in [The New England Journal of Medicine](#), clinical trials on 945 patients with advanced melanoma skin cancer using a combination of immunotherapy drugs nivolumab and ipilimumab proved to cure 58% of the patients by shrinking or eliminating cancerous tumors. Prof. Jacob Schachter, head of the Ella Institute at Israel's Sheba Medical Center, took part in developing this drug which was hailed by the scientific community as a major breakthrough in cancer research that can potentially replace chemotherapy to treat many types of cancer.

6. Nobel Prize Winner and Team Find Proteins to Suppress Cancer

New research from the Haifa laboratory of Nobel Prize winner Prof. Aaron Ciechanover has uncovered two proteins that suppress cancer cell growth and development. Dr. Ciechanover has stated that "many more years are required to establish the research and gain a solid understanding of the mechanisms behind the suppression of the tumors. The development of a drug based on this discovery is a possibility, although not a certainty, and the road to such a drug is long and far from simple."

7. Hacking the Cancer's Communication System

Rony Seger from the [Weizmann Institute of Science](#) and his team developed a way to treat a number of cancers by blocking off messages from the nucleus of a cancer cell. By shutting off the information that creates cancerous mutations the spread of cancer can be halted.

8. Biop Medical Device to Provide Early Detection of Cervical Cancer

Cervical cancer is the second most common cancer among women, and the #1 cancer killer of women in the developing world. [Biop Medical](#) developed an innovative technology for the identification of cancerous and precancerous cells in epithelial tissues. The Biop system will enable point-of-care diagnosis of the entire cervix, generating a real-time map of the cervix. Immediately after testing, patients will receive a near-certain diagnosis, eliminating the prolonged waiting time and anxiety, associated with the current, inefficient process. This technology can reduce the time needed to diagnose one of the biggest killers of women – from weeks, to minutes.