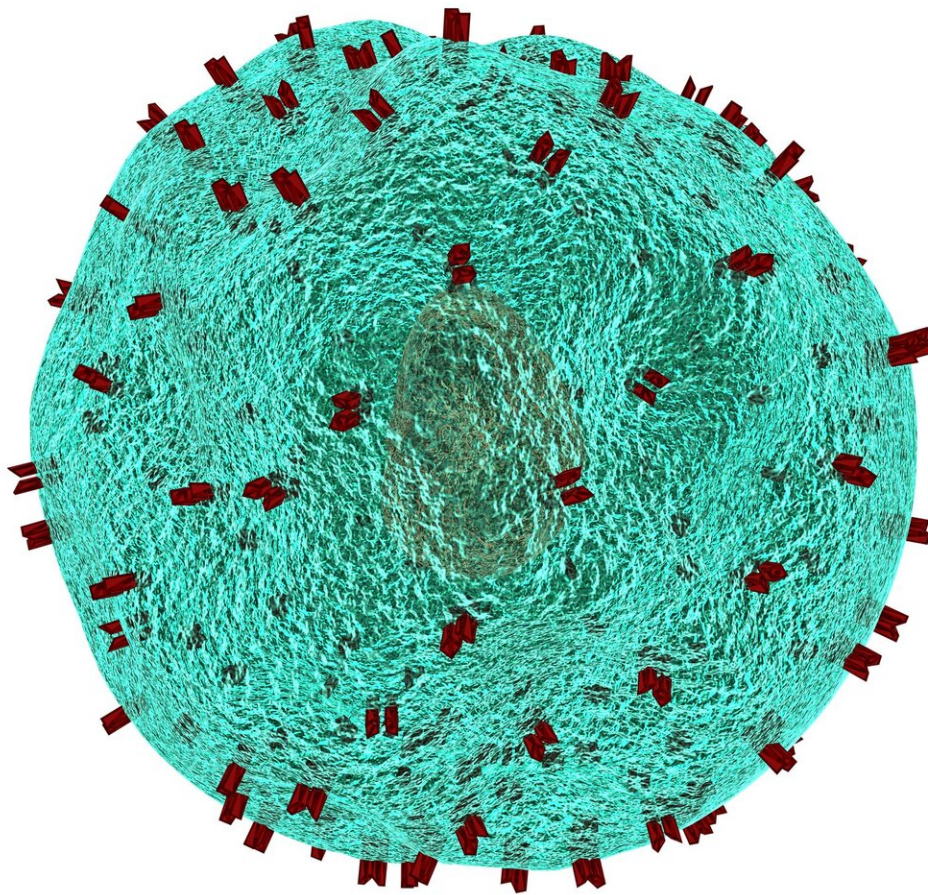


# Researchers generate direct measurement of interaction between immune cells and cancer cells from a patient's biopsy

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Researchers at Bar-Ilan University have unveiled a technology that promises to improve cancer treatment decisions based on a patient's biopsy. The pioneering biological research and development measures changes in immune system cells adjacent to cancer cells, providing crucial insights into the patient's immune response and potentially enhancing the effectiveness of immunotherapy.

Immunotherapy represents a targeted approach to [cancer treatment](#), harnessing the body's own immune system to identify and eliminate cancer cells. Unlike traditional chemotherapy, which can have widespread effects on [healthy cells](#), immunotherapy offers a more precise and targeted treatment option.

The research, [published](#) in *RNA*, marks the first time that a direct measurement of the interaction between immune cells and cancer cells from a patient's biopsy has been achieved. This development opens new avenues for tailoring treatments to individual patients and improving outcomes.

"Cancer cells have the ability to manipulate immune cells, evading the body's natural defenses," explains Dr. Shahar Alon, lead researcher at Bar-Ilan University's Faculty of Engineering. "By quantifying the molecular changes that occur when immune cells encounter cancer cells, we gain a deeper understanding of this complex interplay."

Using advanced scanning techniques developed by Dr. Alon's research group, the team examined how immune cells express genes differently

when in proximity to cancer cells. They found that specific types of immune cells exhibit distinct genetic signatures when near cancerous tissue.

"The analysis revealed dozens of genes that are uniquely expressed in immune cells that interact with cancer cells," says Dr. Alon. "Notably, CD8 T immune cells, known for their ability to bind and eliminate cancer cells directly, showed a higher level of gene activation compared to CD4 T cells."

This innovative approach to sequencing biopsies offers a powerful tool for identifying genes involved in the [immune response](#) to cancer. By assessing the degree of immune system activation in individual patients, clinicians can make more informed decisions about immunotherapy treatments, ultimately improving patient outcomes.

Moshe Bar Haim, CEO of the Israel Cancer Association, says, "Research knows no boundaries, and every breakthrough has the potential to benefit patients worldwide. This new understanding of the immune system's response to [cancer cells](#) holds promise for more effective treatments and higher recovery rates."

**More information:** Michal Danino-Levi et al, Computational analysis of super-resolved in situ sequencing data reveals genes modified by immune-tumor contact events, *RNA* (2024). [DOI: 10.1261/rna.079801.123](https://doi.org/10.1261/rna.079801.123)

Provided by Bar-Ilan University

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