

White blood cells related to allergies may also be harnessed to destroy cancer cells

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A new Tel Aviv University study finds that eosinophils—white blood cells that may have played an evolutionary role in combating parasites, but which are today responsible for chronic asthma and modern allergies—may be used to eliminate malignant colon cancer cells.

The research was led by Prof. Ariel Munitz of the Department of Microbiology and Clinical Immunology at TAU's Sackler School of Medicine and conducted by TAU doctoral student Hadar Reichman of Prof. Munitz's TAU laboratory, in collaboration with colleagues in Tel Aviv Medical Center's Gastroenterology Department. It was published in *Cancer Immunology Research* on January 21.

"Eosinophils are [white blood cells](#) that secrete powerfully destructive proteins," Prof. Munitz says. "They may have played an evolutionary role in combatting parasites. But now that most people, particularly in the West, enjoy good hygiene and few parasites, the [eosinophils](#) have become destructive agents, causing allergies and asthma.

"Our new research theorized that since eosinophils are capable of killing parasites and can cause damage in the lungs of asthma patients, they might play a role in [cancer treatment](#) and would be able to kill [tumor cells](#)."

The largest eosinophil reservoir is situated in the digestive system, so the researchers initially decided to test their theories on colon cancer. In the first stage of research, they selected samples from tumors of 275

patients to determine the number of eosinophils in a tumor as compared with the stage and severity of the disease.

"We found that the higher the number of eosinophils in the tumor, the less severe the disease, which represents a clear correlation," says Prof. Munitz. "We identified that the cancerous environment attracts these [cells](#), which infiltrate the tumors and flourish there for a long time."

The researchers subsequently tested their hypotheses in various mouse models of colorectal cancer. They discovered that eosinophils displayed potent anti-tumor activities and could directly kill tumor cells.

"We also found that when eosinophils were activated by a protein called IFN-gamma, they induced an even greater tumor-killing response," says Prof. Munitz. "Following various extensive analyses, we concluded that eosinophils have unique and distinct activities in comparison with other cells present in the tumor. For example, eosinophils can kill tumors independently of known tumor-fighting cytotoxic T cells."

The fact that eosinophils represent a distinct weapon in fighting tumor cells opens new avenues for treatment of cancer, either by encouraging eosinophils to unleash their robust anti-[tumor](#) response, or by combining treatments to harness the potent forces of both eosinophils and cytotoxic T cells.

"We have discovered a new target for immunotherapy for [cancer](#) patients—the eosinophils," concludes Prof. Munitz. "We hope that our research will serve as a foundation for drug development in a number of different approaches."

More information: Hadar Reichman et al, Activated Eosinophils Exert Antitumorigenic Activities in Colorectal Cancer, *Cancer Immunology Research* (2019). [DOI: 10.1158/2326-6066.CIR-18-0494](https://doi.org/10.1158/2326-6066.CIR-18-0494)

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