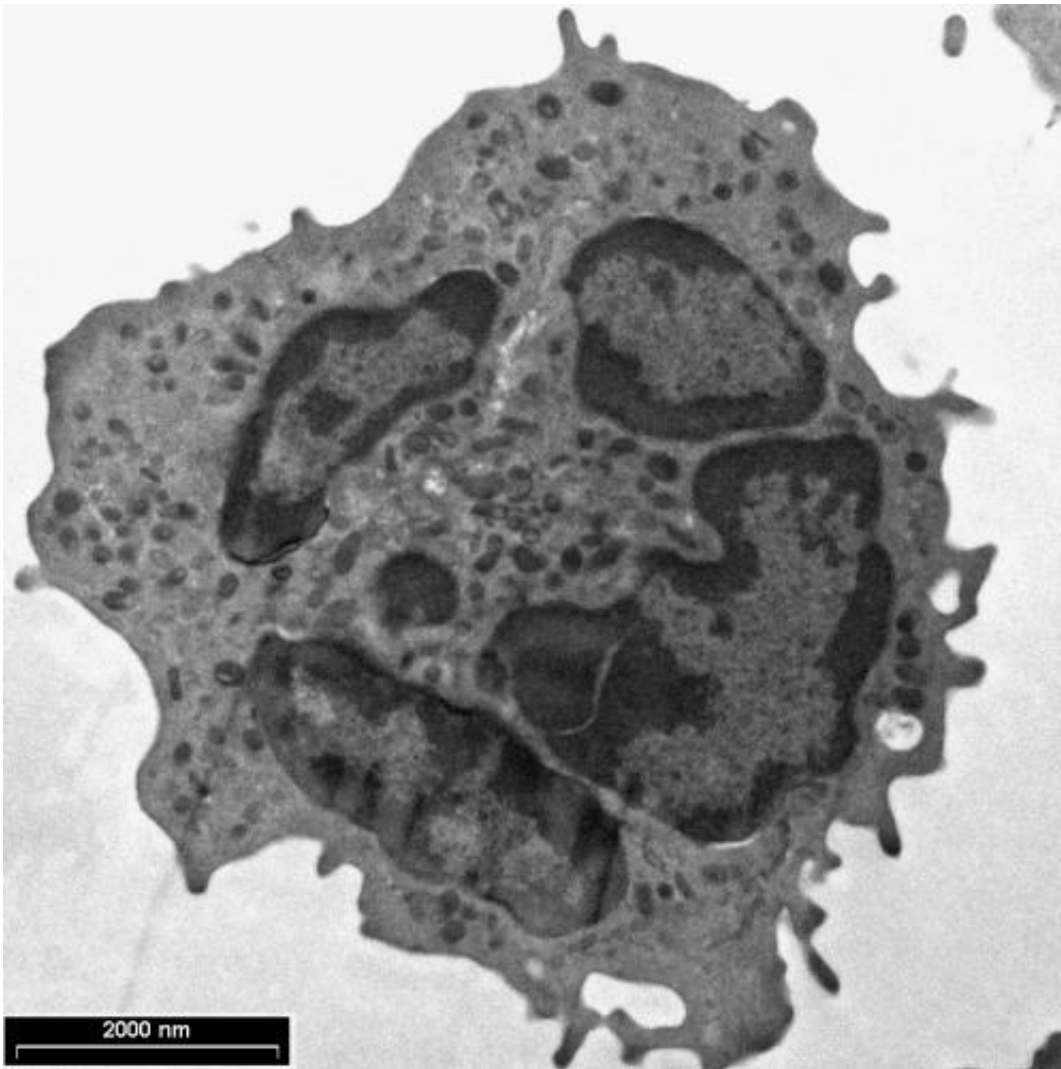


# Angel or devil? For cancer, not all neutrophils are created equal

January 22 2015

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Electron microscope image of a harmful neutrophil described in the research of Dr. Zvika Granot and Dr. Zvi Fridlender. Credit: (Photo: Hebrew University of Jerusalem)

New research from the Hebrew University of Jerusalem shows that the most common form of white blood cells, called neutrophils, contain many different subtypes, of which some fight the development of cancer and others promote its progression. The research could help pave the way to new therapies that fight cancer by increasing anti-tumor neutrophils while limiting pro-tumor neutrophils.

Traditionally, [cancer research](#) has focused on trying to identify aspects of cancer development that can be exploited therapeutically through treatments such as chemotherapy and radiation. In the last decade new approaches to cancer have involved activating the immune system against cancer cells without harming healthy tissue, which has proven effective in a limited range of patients.

However, in recent years it became apparent that in addition to the [cancer cells](#) themselves, there are [healthy cells](#) surrounding a tumor that play a critical role in promoting [cancer development](#). These cells, which provide a supportive environment that promotes [tumor growth](#) and allows it to spread, are potential targets for new cancer therapies.

In this context the role of [neutrophils](#), which comprise between 50%-70% of all [white blood cells](#), remains controversial. While neutrophils are traditionally associated with inflammation and fighting infections, accumulating data suggest they also play an important role in tumor biology.

In a new study published today in the journal *Cell Reports*, scientists working with mouse tumors and human blood samples challenge the concept that mature neutrophils are limited in their ability to change and take on new characteristics. They also show that in contrast to current perceptions, neutrophils are not a homogeneous population of cells but rather consist of multiple subtypes.

The research was led by Dr. Zvika Granot, at the Hebrew University's Institute for Medical Research Israel-Canada (IMRIC) in the Faculty of Medicine, and Dr. Zvi Fridlender, at the Hadassah-Hebrew University Medical Center's Institute of Pulmonary Medicine.

Importantly, the researchers found that while some neutrophils have anti-tumor properties, others in fact promote tumor progression. They also showed that in early stages of the disease, tumor-limiting neutrophils prevail. However, as cancer progresses the tumor-promoting neutrophil subpopulation that promotes tumors growth outcompete the tumor-limiting neutrophil subpopulation and the overall neutrophil contribution becomes tumor-promoting.

According to Dr. Granot, "The novel distinction between harmful and beneficial neutrophils opens up new diagnostic and therapeutic opportunities. We are currently evaluating the effects of boosting the helpful anti-tumor neutrophil population, while limiting the tumor-promoting neutrophil population, on progression of the disease. If successful, this therapeutic strategy may take us closer to developing effective new therapies for cancer."

The research appears in the journal *Cell Reports* under the title "Phenotypic diversity and plasticity in circulating neutrophil subpopulations in cancer."

**More information:** *Cell Reports*, [www.cell.com/cell-reports/abst ... 2211-1247\(14\)01092-4](http://www.cell.com/cell-reports/abstract/S2211-1247(14)01092-4)

Provided by Hebrew University of Jerusalem

Citation: Angel or devil? For cancer, not all neutrophils are created equal (2015, January 22)

retrieved 5 May 2024 from

<https://medicalxpress.com/news/2015-01-angel-devil-cancer-neutrophils-equal.html>

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