

Study reveals that chemotherapy works in an unexpected way

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It's generally thought that anticancer chemotherapies work like antibiotics do, by directly killing off what's harmful. But new research published online on April 4 in the Cell Press journal *Immunity* shows that effective chemotherapies actually work by mobilizing the body's own immune cells to fight cancer. Researchers found that chemo-treated dying tumors secrete a factor that attracts certain immune cells, which then ingest tumor proteins and present them on their surfaces as alert signals that an invader is present. This new understanding of how chemotherapy works with our immune systems could prompt new tactics for treating cancer.

"Successful chemotherapeutics convert the tumor into a [therapeutic vaccine](#), hence mobilizing the host's immune system against the cancer," explains senior author Dr. Guido Kroemer, of the Institut Gustave Roussy, in France.

Dr. Kroemer and his colleagues found that when chemotherapy kills and bursts open [cancer cells](#), the cells release a factor called ATP. The factor recruits [immune cells](#) to the tumor site, where they are educated to acquire their function—namely, to ingest and present tumor proteins on their surfaces. The researchers found that when these trained immune cells are blocked, chemotherapy (specifically, anthracyclines) cannot efficiently reduce the growth of tumors in mice. Also, when these trained immune cells are injected into other mice, the mice can fight off cancer cells that are subsequently injected.

The findings point to a new strategy to improve cancer treatments. "Anticancer therapies and immunotherapies might be combined in a way to optimize the local recruitment and function of immune cells—for instance, by increasing extracellular ATP levels—with the goal of boosting the chemotherapy-induced anticancer immune response," says Dr. Kroemer. Also, measuring the recruitment of immune cells to tumor sites after chemotherapy might help predict how well a patient's cancer will respond to the treatment.

More information: *Immunity*, Ma et al.: "Anticancer chemotherapy induced intratumoral recruitment and differentiation of antigen presenting cells." [dx.doi.org/10.1016/j.immuni.2013.03.003](https://doi.org/10.1016/j.immuni.2013.03.003)

Provided by Cell Press

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