

## Cancer 'turns off' important immune cells, complicating experimental vaccine therapies

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A research report published in the September 2012 issue of the *Journal of Leukocyte Biology* offers a possible explanation of why some cancer vaccines are not as effective as hoped, while at the same time identifies a new therapeutic strategy for treating autoimmune problems. In the report, scientists suggest that cancer, even in the very early stages, produces a negative immune response from dendritic cells, which prevent lymphocytes from working against the disease. Although problematic for cancer treatment, these flawed dendritic cells could be valuable therapeutic tools for preventing the immune system from attacking what it should not, as is the case with autoimmune disorders and organ transplants.

"Immunotherapy of cancer has been an elusive research target that, though promising, never seems to 'get there,'" said José Alexandre M. Barbuto, Ph.D., from the Laboratory of Tumor Immunology, Department of Immunology, Institute of Biomedical Sciences at the University of São Paulo, in São Paulo, Brazil. "This study helps us to better understand the mechanisms by which tumors avoid immune recognition and rejection and may, therefore, teach us how to actually engage effectively the immune system in the fight against tumors, thus achieving much better clinical responses and, consequently, quality of life, in our therapeutic approaches."

To make this discovery, researchers obtained a small sample of blood from [breast cancer patients](#), and from healthy volunteers. The blood cells were then separated and induced to become dendritic cells. Researchers

then used these laboratory-generated dendritic cells to induce responses from other [immune system cells](#), namely lymphocytes. While dendritic cells from the healthy donors induced vigorous lymphocytic responses, [dendritic cells](#) from cancer patients induced mainly the activation of a specific type of lymphocyte, a regulatory lymphocyte that works as a "brake" for other types of lymphocytes.

"Understanding why the immune system does not recognize and eliminate cancer is critical to developing effective immunotherapies to fight the disease," said John Wherry, Ph.D., Deputy Editor of the [Journal of Leukocyte Biology](#). "Immunologists have been trying to unravel the answer to this question for decades and have realized that the problem is both on the immune system side, and because cancer cells appear to actively 'fly under the radar' avoiding immune system detection. This article offers insights into the underlying mechanisms regulating a key immune cell type, the dendritic cell, involved in initiating anti-tumor responses."

**More information:** Rodrigo Nalio Ramos, Lilian Sally Chin, Ana Paula S. A. dos Santos, Patrícia Cruz Bergami-Santos, Fábio Laginha, and José Alexandre M. Barbuto. Monocyte-derived dendritic cells from breast cancer patients are biased to induce CD4+CD25+Foxp3+ regulatory T cells. *J Leukoc Biol* September 2012 92:673-682; [doi:10.1189/jlb.0112048](https://doi.org/10.1189/jlb.0112048)

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