

# Your immune system: On surveillance in the war against cancer

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Predicting outcomes for cancer patients based on tumor-immune system interactions is an emerging clinical approach, and new research from Wake Forest Baptist Medical Center is advancing the field when it comes to the most deadly types of breast cancer.

"We know that one function of our immune system is to detect and destroy pre-[malignant cells](#) before they can become cancer," said lead author Lance D. Miller, Ph.D., associate professor of [cancer biology](#) at Wake Forest Baptist. "However, sometimes the immune system becomes unresponsive to the presence of these cells and a tumor develops."

This unresponsiveness can be temporary, and the immune system can remain alerted to the fact that there's a problem. [Immune cells](#) can stand post along the borders of the tumor and even infiltrate the tumor core, where they may gain a better position for eventual attack. "We now have technologies that allow us to quantify aspects of this interaction and from that information we can make predictions about cancer outcomes, Miller said."

The study published online ahead of print last month in the journal *Genome Biology*.

This approach is known as [gene expression profiling](#), and by studying the [expression profiles](#) of 2,000 human [breast tumors](#), Miller and his team identified several immune gene signatures that reflect the abundance and anti-tumor properties of different types of tumor-infiltrating immune

cells. They found that in certain aggressive types of breast cancer, such as basal-like or triple negative disease, these immune signatures were highly predictive of [cancer recurrence](#) years after initial treatment.

"Strikingly, the patients who seemed to benefit the most were those with highly proliferative and clinically aggressive disease," Miller said. "In these cases, high expression levels of the immune genes predicted for recurrence-free survival, while low immune gene expression predicted for a high likelihood of cancer recurrence."

An important next step, Miller said, will be translating this into a diagnostic test that may help doctors make more informed treatment decisions.

"Knowing a tumor's immunogenic disposition could help oncologists know whether to prescribe more or less aggressive treatment regimens, or perhaps, to know which drugs, specifically, will be most effective," he said.

For doctors like Bayard Powell, M.D., chief of hematology and oncology at Wake Forest Baptist's Comprehensive Cancer Center, new drugs designed to enhance anti-tumor immune responses are beginning to play a major role in the treatment of certain forms of cancer.

"At Wake Forest Baptist we are now fighting cancer with state-of-the-art therapies including immunotherapeutics," Powell said. "How a tumor's immunogenic disposition influences the effectiveness of immunotherapeutic drugs is an important question that could lead to valuable new strategies in personalized medicine."

Provided by Wake Forest University Baptist Medical Center

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