

A single gene separates aggressive and non-aggressive lymphatic system cancer

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For a rare form of cancer called thymoma, researchers have discovered a single gene defining the difference between a fast-growing tumor requiring aggressive treatment and a slow-growing tumor that doesn't require extensive therapy.

Thymoma is a cancer derived from the [epithelial cells](#) of the thymus, an organ critical to the lymphatic system where T-cells, or so-called "killer cells," mature. Very little is known about the role of the [gene mutation](#) GTF2I in human tumors, but scientists from Georgetown Lombardi Comprehensive Cancer Center and the National Cancer Institute say almost all indolent (slow growing and non-aggressive) forms of thymoma they tested have the mutation. They report their finding in the current issue of *Nature Genetics*.

"Indolent thymomas seldom become aggressive, so the discovery that a single gene can identify tumors that do not need aggressive care is an important development for our patients," says the study's senior investigator, Giuseppe Giaccone, MD, PhD, associate director for clinical research at Georgetown Lombardi.

In addition to the clinical implications, the study is important because "it is highly unusual to find a single mutated gene that can define a class of tumors," he said. "Usually a substantial number of genes are involved. In fact, we also found that the more aggressive thymomas express well-known cancer genes found in other tumors—which might give us clues about novel treatment of these cancers."

The thymus is located in the chest behind the breastbone. Thymoma and a second type of cancer of the thymus called thymic carcinoma are rare. According to the National Cancer Institute, these cancers counted together make up for only .2 to 1.5 percent of all cancers— one case occurs in about every 700,000 individuals.

Most of the diagnosed patients have surgery, but, depending on the presumed aggressiveness of the [cancer](#), some patients will have radiation and/or chemotherapy in addition or instead of surgery. "The use of these treatments in thymomas is controversial, because we know some patients don't need [aggressive therapy](#), but until now, there's not been a clear way to know who those patients are," Giaccone says.

More information: A specific missense mutation in GTF2I occurs at high frequency in thymic epithelial tumors, *Nature Genetics*, [DOI: 10.1038/ng.3016](#)

Provided by Georgetown University Medical Center

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