Switched before birth: Study shows protein creates tumor-fighting cells
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Revealing a biological combat strategy worthy of a five-star general, researchers from Houston Methodist Hospital, University of Chicago and Cornell University have shown how a cell surface receptor—a specialized protein which communicates signals between a cell and the outside world—can mobilize immune cells to attack, rather than protect, malignant tumors.

The researchers report their findings in today's issue of the journal Nature Communications.

In most cases, CD4+ T-cells in the immune system, commonly called CD4 or helper T-cells, scan the surface of foreign invaders within the body, including tumor cells, and send out chemical signals to mobilize other immune cells—so-called killer T-cells—which then attack and destroy the threat. However, tumor cells often evade destruction by prompting immature T-cells to become regulatory T-cells, or Tregs. These cells are marked by a protein inside them, Foxp3+, which suppresses the ability of killer T-cells to attack tumors. Protected from the immune system, the tumor can grow unrestrained and spread cancer throughout the body.

One potential solution is a cell surface protein called glucocorticoid-induced tumor necrosis factor receptor, or GITR. Scientists have known that GITR can prevent the production of Foxp3+ Tregs, eliminating the tumor's natural bodyguard against the immune system. Concurrently, GITR directs immature T-cells to become activated tumor killers called Th9 cells that express a cancer-fighting protein known as interleukin 9 (IL-9). However, until the findings reported today, the mechanism by which this switch from tumor protector to tumor destroyer occurs was poorly defined.

"Immune cells such as the Th9 are powerful tools for eliminating cancer cells, as long as they are properly stimulated through the right molecular pathways," Li said. "Our study has shown how one such pathway works and that is exciting, especially when a companion study in South Korea found GITR yielded similar anti-tumor activity against four different cancers."


Provided by Houston Methodist