Tumors hide out from the immune system by mimicking lymph nodes

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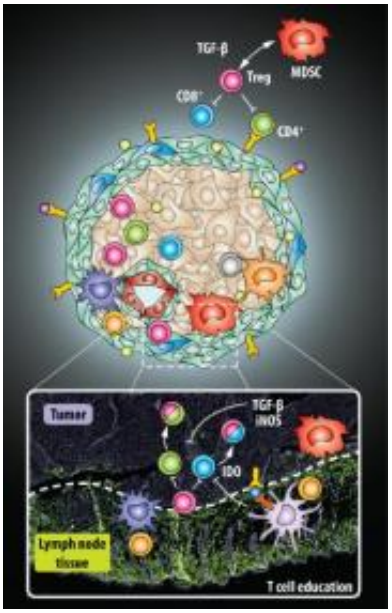

The tumor has transformed its outer layer into lymphoid-like tissue to avoid detection by the immune system. Credit: EPFL

A new mechanism explaining how tumors escape the body's natural immune surveillance has recently been discovered at EPFL (Ecole Polytechnique Fédérale de Lausanne) in Switzerland. The study shows how tumors can create a tolerant microenviroment and avoid attack by the immune system by mimicking key features of lymph nodes.

The discovery, published in *Science* and in *Science Express*, online March

25, 2010, underscores the role of the lymphatic system in cancer and may open up new possibilities for cancer treatment.

"The tumor tricks the body into thinking it is healthy tissue," says lead author Melody Swartz, head of the Laboratory of Lymphatic and Cancer Bioengineering (LLCB) and EPFL professor. Swartz and her team set out to understand how immune tolerance is induced by tumors, allowing them to progress and spread.

The researchers from EPFL concentrated their efforts on a certain protein that is normally present in healthy lymph nodes to attract T cells and program them to perform vital immune functions. They found that some tumors can secrete this protein to transform the outer layer of the tumor into lymphoid-like tissue. This outer layer then attracts and effectively re-programs the T cells to recognize the tumor as friend not foe, resulting in a tumor that goes undetected by the immune system.

Since most tumors progress only if they have escaped the immune system, this new understanding of one mechanism by which the tumor can bypasses or hides from immune defenses is an important step towards future cancer therapies. "The finding that tumors can attract nad′ve and regulatory T cells and educate them has important implications for tumor immunotherapy," says Jacqui Shields, from LLCB. The study also opens up potential novel areas of research focusing on the relationship between lymphatic systems and cancer research. According to Shields, the concept that tumors mimic lymphoid tissue to alter the host's immune response represents a new understanding of tumors' interactions with the lymphatic system.

Provided by Ecole Polytechnique Fédérale de Lausanne