Regulatory T Cell Promotion of Brain Metastatic Processes

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Metastatic breast cancer is the second leading cause of cancer-related death in women. Brain metastasis represents an advanced stage where targeted treatment options are lacking. Regulatory T (Treg) cells, a class of immune cells that suppress immune responses and benefit tumor growth, are conspicuously present in mouse and human primary and metastatic tumors, and correlate with poor prognosis in many cancers. Using a mouse model of breast cancer, we showed that killing these cells inhibits tumor and lung metastatic growth, significantly prolonging disease-free survival in those mice. We learned that Treg cells modify the tumor soil, making it more hospitable to cancer cells, and plan to study how they accomplished that.

Given that we lack the means of targeting Treg cells in humans, the results of our studies will provide the opportunity to devise innovative therapeutic options to interfere with their function. Importantly, our mouse model is insensitive to the current immunotherapies in clinical trials, representing a large majority of patients who are not lucky enough to benefit from these approaches. Furthermore, Treg cell ablation has a potent effect on established lung metastasis, suggesting that our discoveries will have the potential to benefit patients at advanced stages of metastatic disease.