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Xiaochuan Hu* (xiaochuan.hu@ttu.edu) and **Sophia Jang**. *Optimal treatments in cancer immunotherapy.*

We apply optimal control theory to a model of interactions between cancer cells, CD4⁺ T cells, cytokines and host cells to devise a best immunotherapy for treating cancer. The CD4⁺ T cells cannot kill cancer cells directly but use the cytokines produced to suppress tumor growth. The immunotherapy implemented is modeled as a control agent and it can be either transferring of CD4⁺ T cells, cytokines or both. We establish existence and uniqueness of the optimal control. The optimal treatment strategy is then solved numerically under different scenarios. Our numerical results provide best protocols in terms of strengths and timing of the treatments. (Received February 06, 2018)