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Peng Feng* (pfeng@fgcu.edu), 11501 FGCU Blvd. S., Fort Myers, FL 33965, and **Menaka Navaratna**, 11501 FGCU Blvd. S., Fort Myers, FL 33965. *Role of Regulatory T Cells on a Tumor-Immune System with Immunotherapy*. Preliminary report.

Recent advance in the field of regulatory T cell reveals that it plays a vital role during immunotherapy. For example, a higher ratio between regulatory T cells and effector T cells within tumor tissue is associated with worse prognoses in many cancers, including ovarian cancer (Leffers et al., 2009), lung cancer (Tao et al., 2012), glioblastoma (Sayour et al., 2015). On the other hand, the tug war between regulatory T cells and effector T cells for interleukin-2 may chisel immune responses against cancer. In this work, we propose a mathematical model that studies the role of regulatory T cells during immunotherapy. We demonstrate mathematically, for the first time, that the initial ratio between regulatory T cells and effector T cells does impact the tumor recurrence time. We also demonstrate the effectiveness of utilization of IL-2 may flip the outcome of immunotherapy, providing further evidence that it may be clinically viable to modulate the consumption of IL-2 by Tregs. (Received September 13, 2019)