A Mathematical Model to Explore the Potential of Combinations of ADT and Immunotherapies

Johnna Barnaby
Shippensburg University of Pennsylvania, jpbarnaby@ship.edu

Prostate Cancer is initially dependent on androgens (testosterone) for its growth and survival. Therefore, androgen deprivation therapy (ADT) is used to treat late stage and metastatic prostate cancer. Initially tumors respond well to this treatment; however, mutations result in tumors becoming castration resistant. Immunotherapies are being used to treat castration resistant tumors. Since ADT induces an immune response at the tumor site, it is thought that a combination of ADT and immunotherapies may be more beneficial. We developed a mathematical model that is able to capture the treatment and immune responses that occurs with treatment with ADT or immunotherapies. We then use this model to simulate the combination of these therapies.