Comparing dynamics of intermittent treatment between breast and prostate cancer

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Abstract

Various models have attempted to mechanistically explain the growth of prostate cancer and its resistance to androgen ablation therapy. Breast cancer data for tumor proliferation and recurrence post-intermittent treatment, mimics that of prostate cancer. Prostate proliferation is based off the prostate serum androgen levels and the breast proliferation is based off the cross-sectional area of a tumor as concentrations of cancer cells. Prostate intermittent therapy is androgen ablation and breast therapy is the monoclonal antibody Trastuzumab. A system of ODEs is used from a model used for prostate cancer response to intermittent and continuous androgen ablation therapy and altered to fit similar dynamics from breast cancer. The goal of this work is to have the flexibility of utilizing desirable data sets from either breast or prostate cancer to make predictions of the relapse dynamics from intermittent treatments on patients. This work models the biological similarities and differences of hormone driven breast and prostate cancer.