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Cancer Progression and Tumor Growth Kinetics[1] KRASTAN BLAGOEV, Physics Division, National Science Foundation, Arlington, VA 22180, USA, JAYASHREE KALPATHY-CRAMER, Department of Radiology, Massachusetts General Hospital, Harvard Medical School and the Martinos Center for Biomedical Imaging, Building 129 13th Stre, JULIA WILKERSON, National Cancer Institute, National Institutes of Health, Building 10, 10 Center Drive, Bethesda, MD 20892, USA, SARA SPRINKHUIZEN, YI-QIAO SONG, SUSAN BATES, BRUCE ROSEN, Department of Radiology, Massachusetts General Hospital, Harvard Medical School and the Martinos Center for Biomedical Imaging, Building 129 13th Stre, TITO FOJO, National Cancer Institute, National Institutes of Health, Building 10, 10 Center Drive, Bethesda, MD 20892, USA — We present and analyze tumor growth data from prostate and brain cancer. Scaling the data from different patients shows that early stage prostate tumors show non-exponential growth while advanced prostate and brain tumors enter a stage of exponential growth. The scaling analysis points to the existence of cancer stem cells and/or massive apoptosis in early stage prostate cancer and that late stage cancer growth is not dominated by cancer stem cells. Statistical models of these two growth modes are discussed.

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