Growth Kinetics
Summary

This project is a collaboration between Andrew Trister (Sage Bionetworks) and Kristin Swanson (University of Washington) to measure tumor growth kinetics in two modes (diffusion and proliferation) from pretreatment magnetic resonance images (MRIs). Ideally, two pretreatment MRIs with T1+gad and T2-weighted images are used to measure net proliferation and diffusion rates. In previous work, these measurements have informed characteristics of tumor progression after treatment [1]. They have shown that this ratio, measured from a single time point image, is sufficient to determine survival. Interestingly, they have measured over two orders of magnitude difference in these parameters among patients, demonstrating a significant difference in the underlying biology of individual tumors. They are using The Cancer Genome Atlas’ molecular measurements to investigate underlying biological perturbations driving these different modes of progression.

To this end, they first examine the correlation between different subtypes of glioblastoma as described by Verhaak and colleagues and their modes of progression. In parallel, a similar analysis is performed with the VASARI Research Project to better understand other, perhaps more informative, sequences on MRI. They will then leverage the expertise at Sage Bionetworks to investigate driver genes, as well as construct network representations of multiple perturbations seen in glioblastoma, to better elucidate changes that may occur among individual patients.

Ideally, they anticipate using results from these experiments to inform further investigation into drug discovery and clinical trial design.
Supporting Documentation and Metadata

   a. Abstract
   b. Poster (PDF)

References