1163-92-252 **Heyrim Cho**, **Allison L Lewis*** (lewisall@lafayette.edu) and **Kathleen M Storey**.
Bayesian information-theoretic calibration of patient-specific radiotherapy sensitivity parameters for informing effective scanning protocols in cancer.

For any proposed model of tumor growth and treatment, we observe large variability among individual patients' parameter values, particularly those relating to treatment response; thus, exploiting the use of various metrics such as tumor volume for model calibration can be helpful to infer such parameters both accurately and early. However, taking measurements can be costly and invasive. As such, the determination of optimal times and metrics for which to collect data in order to best inform treatment protocols is of great assistance to clinicians. In this investigation, we employ a Bayesian information-theoretic calibration protocol for experimental design to identify optimal times at which to collect data for informing treatment parameters. Data collection times are chosen sequentially to maximize the reduction in parameter uncertainty with each added measurement, so that a budget of n experimental measurements results in maximum information gain about the model parameter values. In addition to investigating the optimal temporal pattern for data collection, we also develop a framework for deciding which metrics should be utilized at each data collection point. We illustrate this framework with a variety of toy examples, each utilizing a radiotherapy treatment regimen. (Received August 30, 2020)