1125-AA-1079 **Rachel Walker**, Tampa, FL 33612, **Jaime Mejia**, Cali, Colombia, **Domenico Coppola**, Tampa, FL 33612, and **Heiko Enderling*** (heiko.enderling@moffitt.org), Tampa, FL 33612.

A mathematical framework to personalize gastric carcinogenesis screening.

Gastric cancer (GC) is often diagnosed at an advanced stage and consequently remains the third most common cause of cancer-related death worldwide. Early detection and endoscopic surgical therapy has been found to reduce GC-associated mortality, yet an efficient and cost-effective screening program still does not exist. Limiting population-based screening is a high inter-patient heterogeneity in time until progression to cancer, prompting the need for patient-specific screening intervals. We validated the increase in gastric stem cell markers in longitudinal biopsy samples from 70 patients. These data, randomized into training and test cohorts, was used to calibrate and validate a differential equation model to simulate the complex gastric gland dynamics during carcinogenesis. This biology-driven mathematical model was able to reproduce observed dynamics of the stem cell population in a test cohort with high accuracy. Such model can provide a computational tool for the prediction of patient-specific GSC population dynamics, and could guide personalized screening schedules to allow efficient monitoring of disease and the timely detection of malignant transformation. (Received September 14, 2016)