Project Title: “Validation of biomarkers for estimating HIV-1 incidence”

PI: Georgia Tomaras

Designated mentor: Rachel Spreng

Accurate estimates of HIV-1 incidence (the number of new infections over time in a population) is a crucial component of implementing and evaluating prevention strategies. Using machine learning on a diverse set of data generated from HIV-infected individuals, we have previously identified a set of 4 biomarkers to classify recent or longstanding HIV infection (Seaton, Vandergrift et al. JCI Insight, Dec 2017). The goal of this project would be to analyze biomarker data on a separate longitudinal cohort to validate this model and to explore potential novel biomarkers to further improve the accuracy of HIV-1 incidence tests.

**Timeline and Desired Outcomes:**

Weeks 1–2: Review literature on HIV-1, the study cohort(s) of interest, and applicable biologic assays.

Weeks 3–8: Model construction and evaluation. Optimize methods based on regular feedback from mentor.

Weeks 9–10: Summarize and report the findings from this project to the mentor and PI.

**Special Project Features:**

The intern will have the opportunity to present the findings to the project group after finishing the analysis and would be a coauthor on the manuscript arising from this work. The intern will learn about HIV-1 immunology and biomarker discovery.

**Desirable skills:** programming in R or SAS