The first weeks of HIV infection are marked by rapid changes in viral load. At the same time, immune system response mediated through cytotoxic T lymphocytes (CTLs) rises and varies in form and potency. Understanding the interplay between these dynamics, which reflect viral evolution in the presence of immune response mediated selection, presents significant modeling challenges. In this talk, I will discuss some recent work addressing these modeling challenges. (Received January 19, 2015)