

Co-Evolution. An HIV infected individual contains a microcosm of many different viruses and antibodies, and one can study affinity maturation in a single host to understand the development of bnAbs for a particular site on HIV (Fig. 1). In the case of influenza, one must study populations of individuals over a larger timespan to understand bnAb development.

About 10-20% of HIV-infected individuals have been found to produce broadly neutralizing antibodies (bnAbs) against the HIV envelope (Env), the spike found on the virus' outer surface. Unfortunately, bnAbs develop in these individuals after several years (typically 4-5 years) of infection and exposure to different viral variants. Consequently, we would like to understand what drives the mutations in the Envs and the maturation of the antibodies that leads to bnAbs, a process that is still not well understood, since this may inform the design of vaccine components to help bnAbs develop more quickly in uninfected individuals upon vaccination.

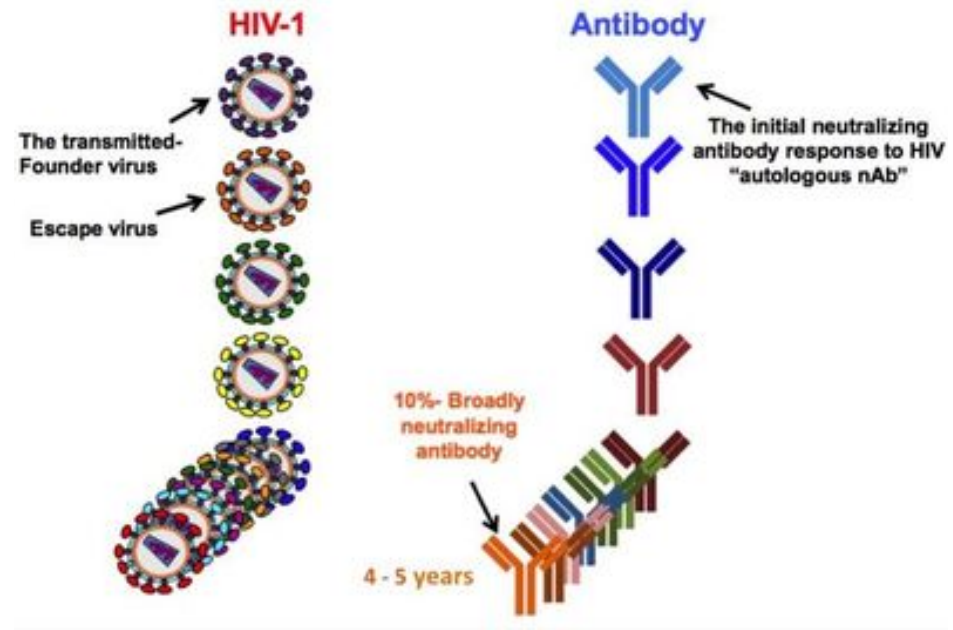


Figure 1. HIV - Antibody "Arms Race". The evolving viruses are shown on the left and the evolving antibodies on the right. The ancestor virus and antibody are at the top; later time points are shown at the bottom.