

Day 2: Brief HIV Primer

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Viral Quasispecies

“Virologists use the term viral quasispecies to mean distributions of nonidentical but related genomes subjected to a continuous process of genetic variation, competition, and selection and which act as a unit of selection.”

(Domingo, Sheldon and Perales, MMBR, 2012)

Viral Quasispecies

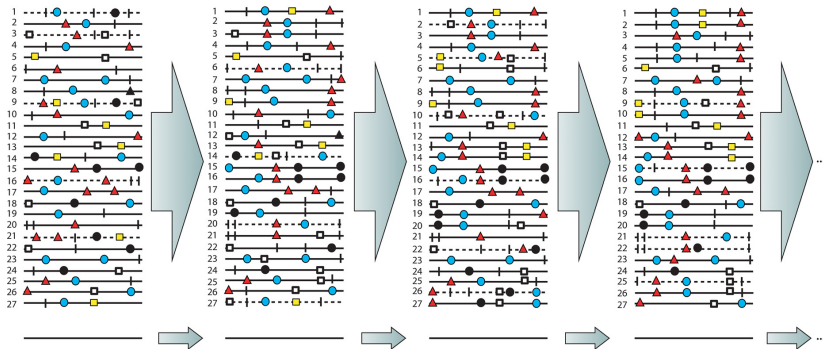
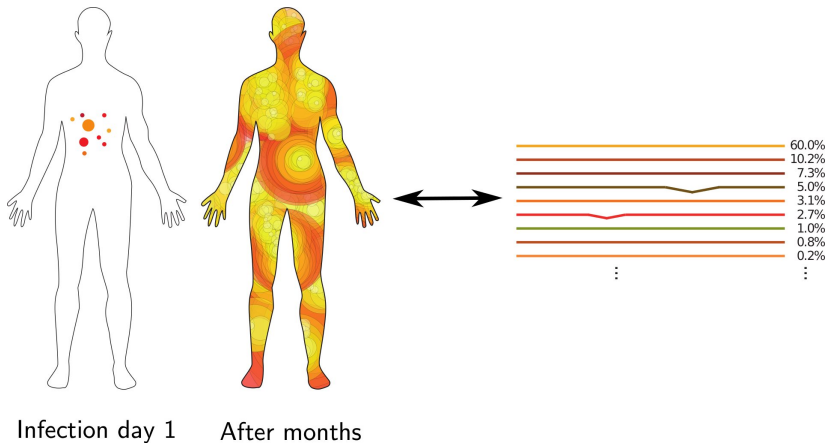


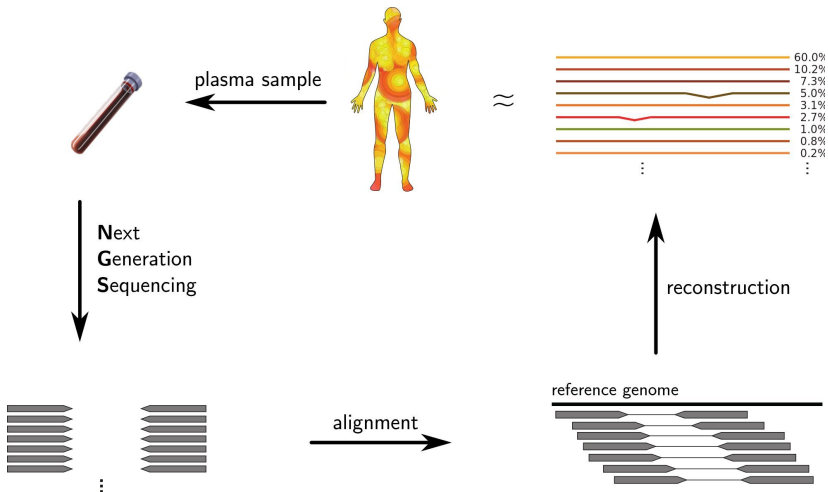
Figure from Domingo, Sheldon and Perales (2012)

HIV forms quasispecies within hosts.

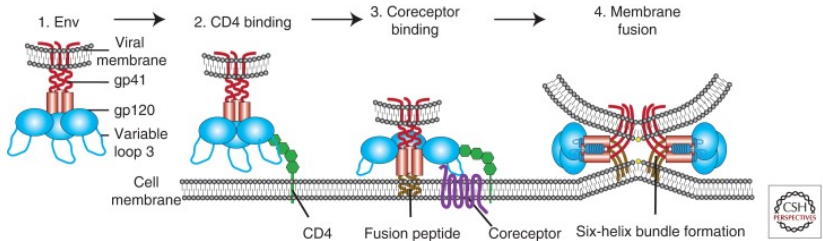
Intra-Patient Viral Diversity



Quasispecies Assembly Workflow



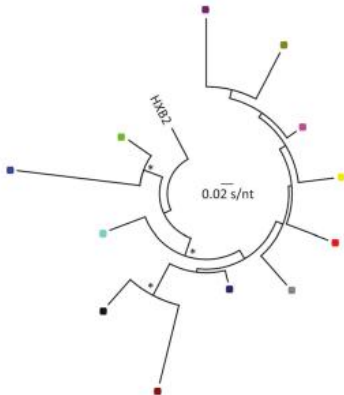
How HIV Enters a Cell



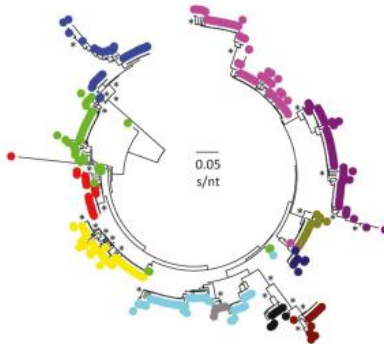
Source: Wilen, Tilton, Doms, Cold Spring Harb Perspect Med., 2012.

Deep Sequence Reveals Diversity

A. Sanger Sequencing



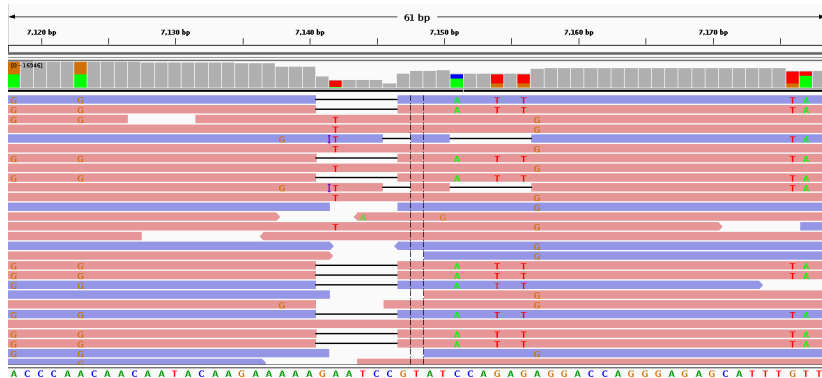
B. Deep Sequencing



Source: Quiñones-Mateu et al., J Clin Virol., 2015.

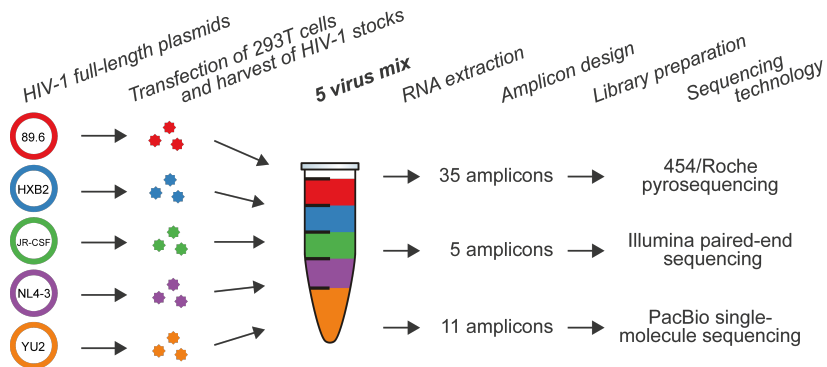
Phylogeny of HIV-1 V3 region of gp120 (env gene)

Alignment Artifacts Hamper Analysis



Gap wander in alignments to env loop regions

Data Set for Today: Five Virus Lab Mix



<https://github.com/cbg-ethz/5-virus-mix>

Di Giallonardo, et al., NAR, 2014.