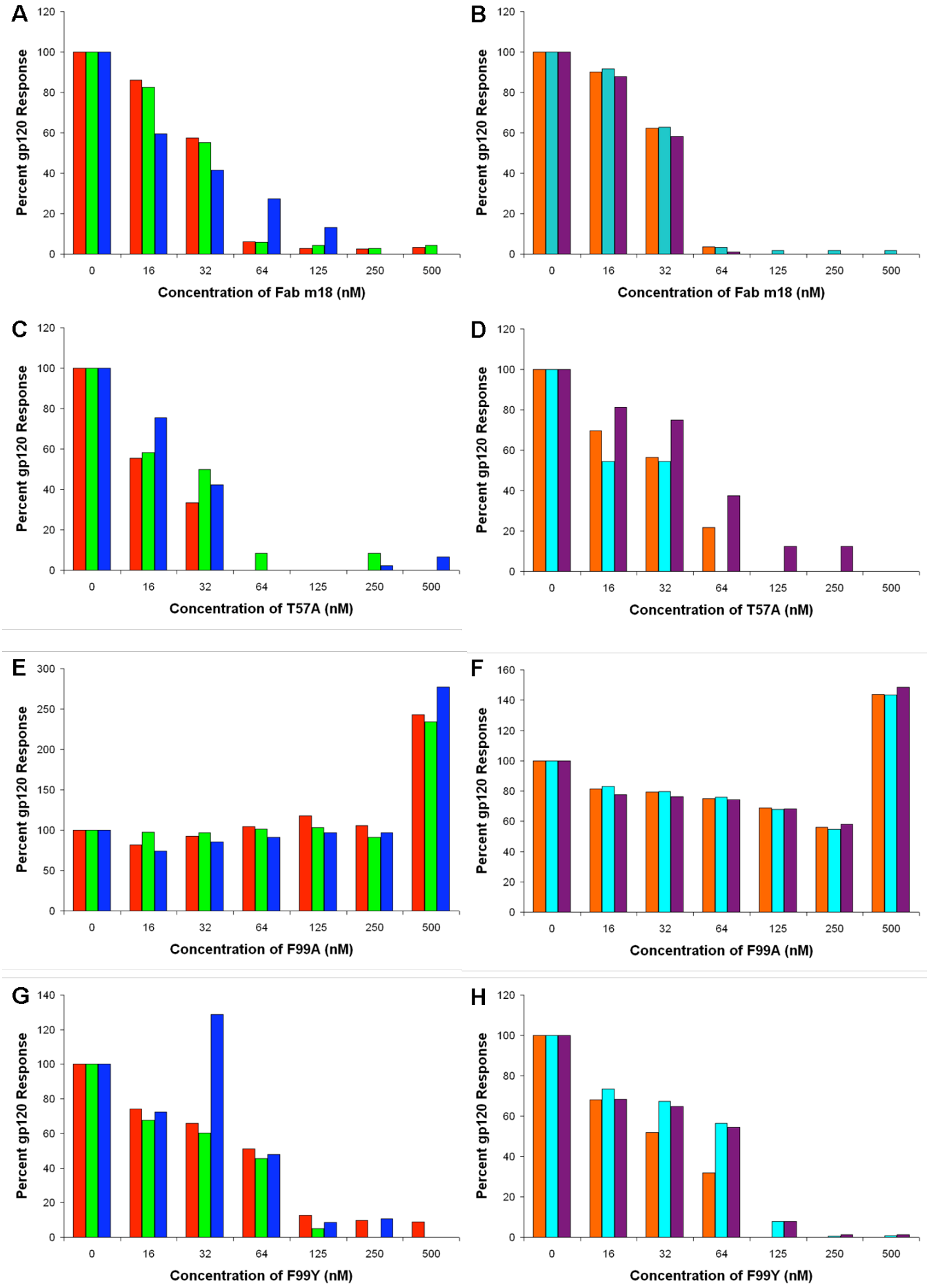
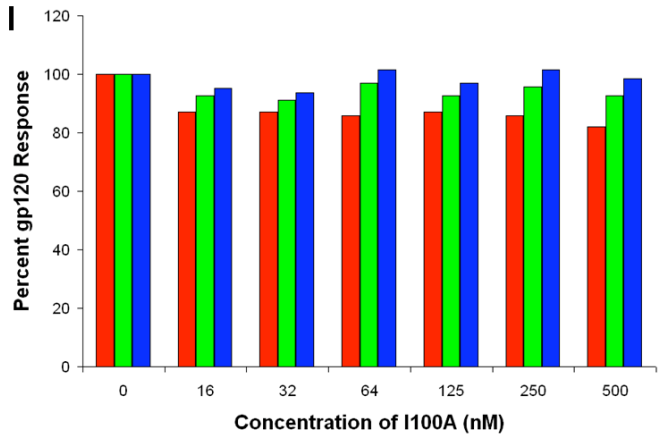
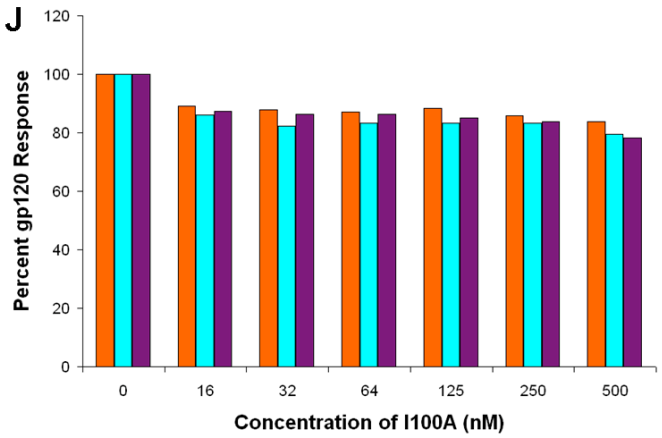
SUPPORTING INFORMATION

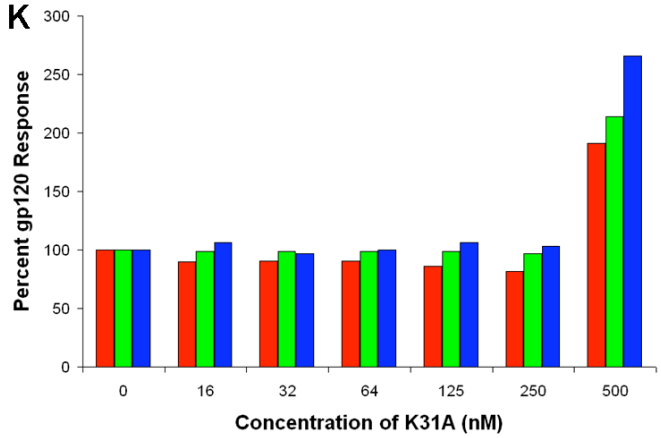
Supplementary Figure 1: Fab m18 mutant competition of YU-2 gp120 binding to immobilized CD4 (**A, C, E, G, I, K and M**) and immobilized mAb 17b (**B, D, F, H, J, L and N**). Mutants tested are indicated in each Figure component. The data represent three trials of the normalized raw data for Fab m18 and mutant competition of YU-2 gp120 binding to sCD4 (red, green and blue) and 17b (orange, cyan and purple). Increasing concentrations of Fab m18 and its mutants (0 to 500 nM) were premixed with 100 nM YU-2 gp120 and were injected over a CM5 sensor surface which had immobilized sCD4 (2000 RU) and IgG 17b (1000 RU). Each concentration series was analyzed in sequence as a set, and then the analysis of the concentration series was repeated at least two more times, resulting in a minimum of 3 analyses per concentration. Premixed samples of YU-2 gp120 and either m18 or m18 mutant were incubated at 4°C until injection into the SPR flow cell. All samples in each concentration series were set up at the same time, such that incubation times at 4°C for each concentration combination varied from a minimum of 10 minutes to a maximum of 355 minutes. At time point 10 minutes, the first sample (100nM gp120, 0 nM m18) was injected across the sensor surface to detect 100% gp120 binding. This injection typically took about 15 minutest to complete. This injection would then be followed by injections of 100nM gp120 premixed with increasing concentrations of Fab m18. In the case of wild type m18, the last injection for the first data set (0 nM m18 to 500 nM m18) finished at time point 115 minutes. This was then followed by an injection of just PBS solution to equilibrate the surface before repeating the previous set two more times. The second set began with an injection of 100nM gp120, started at time point 130 and ended at 235 minutes. The third set began at time point 250 minutes and ended at 355 minutes. Thus, the relationship of incubation times for each concentration combination was t = 10 minutes, t + 120 minutes, t + 240 minutes. The binding of free YU-2 gp120 to the immobilized surfaces were monitored and normalized with 100nM YU-2 gp120 in the absence of

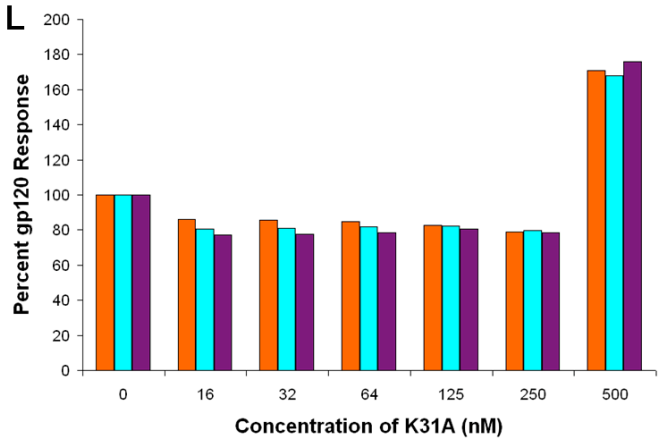
m18 or mutant representing 100% binding to the sCD4 and 17b surfaces. The maximum response at steady state for each concentration was fit to a four-parameter equation through the BIAevaluation program to determine the IC_{50} for inhibition of sCD4 and 17b binding to YU-2 gp120. These data are shown in Table 1 of the main text.

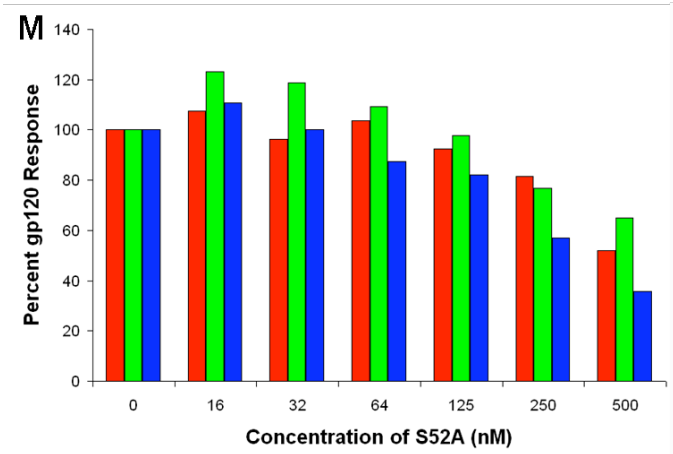

A
Percent gp120 Response
Concentration of Fab m18 (nM)
B
Percent gp120 Response
Concentration of Fab m18 (nM)
C
Percent gp120 Response
Concentration of T57A (nM)
D
Percent gp120 Response
Concentration of T57A (nM)
E
Percent gp120 Response
Concentration of F99A (nM)
F
Percent gp120 Response
Concentration of F99A (nM)
G
Percent gp120 Response
Concentration of F99Y (nM)
H
Percent gp120 Response
Concentration of F99Y (nM)

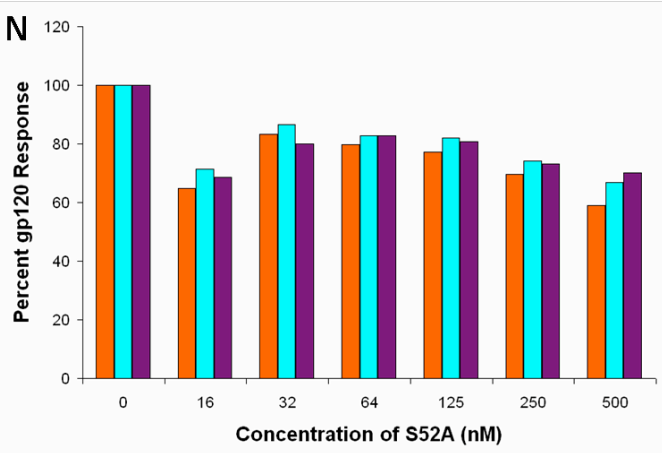

I
Percent gp120 Response
0
20
40
60
80
100
120
0
16
32
64
125
250
500
Concentration of I100A (nM)


J
Percent gp120 Response
0
20
40
60
80
100
120
0
16
32
64
125
250
500
Concentration of I100A (nM)


K
Percent gp120 Response
0
50
100
150
200
250
300
0
16
32
64
125
250
500
Concentration of K31A (nM)


L
Percent gp120 Response
0
20
40
60
80
100
120
140
160
180
200
0
16
32
64
125
250
500
Concentration of K31A (nM)


M
Percent gp120 Response
0
20
40
60
80
100
120
140
0
16
32
64
125
250
500
Concentration of S52A (nM)


N
Percent gp120 Response
0
20
40
60
80
100
120
0
16
32
64
125
250
500
Concentration of S52A (nM)