

Peptide	Sequence	Peptide Length	Peptide Charge	Peptide Mass (Da)
Val1	R ₂ GR ₂	22	+4	699.81
Val2	R ₄	4	+4	642.76
Val4	A ₂ R ₃ A ₂ RA ₂	10	+4	1069.23
Val5	R ₂ GAGR ₂ GAGR ₂	12	+6	1325.50
Val6	R ₂ GAGR ₂	7	+4	827.94
(N/C)CW	ARK ₂ A ₂ KA	8	+4	843.03

Table S1. Unconjugated peptides used for control clotting experiments (see **Figures 3b and S4**).

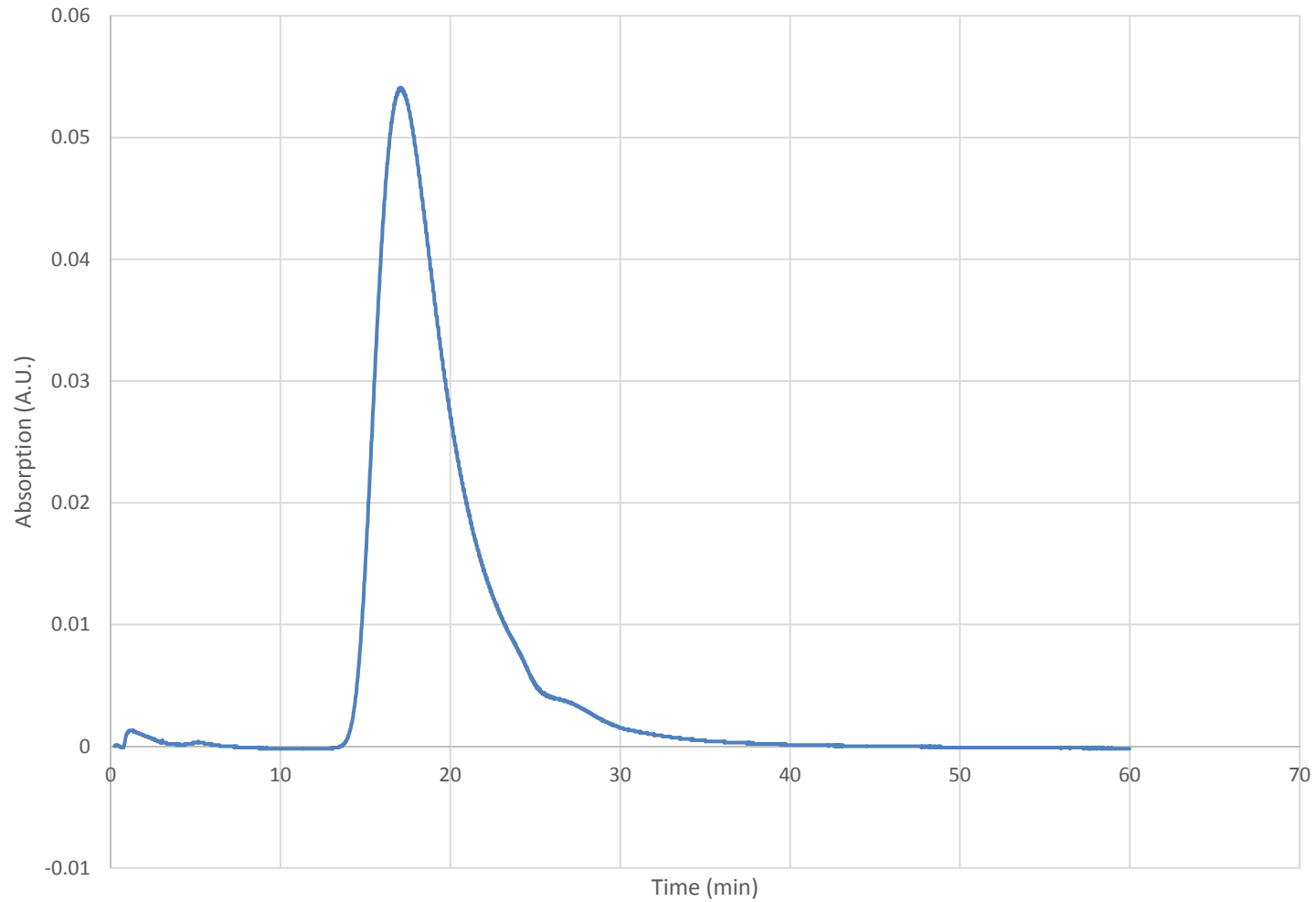
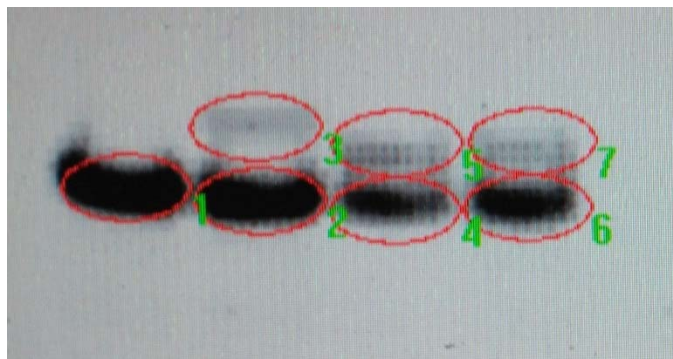


Figure S1. Exemplary size-exclusion FPLC of a co-expressed bacteriophage nanoparticle. The above chromatogram is of particle Val1.

a)



b)

Lane	Nanoparticle Construct	Lower Band Mean Density	Upper Band Mean Density	Lower : Upper Ratio
1	WT	28.2926	n/a	n/a
2	Val1	25.4153	1.87547	13.5514 : 1
3	Val2	10.6172	1.77196	5.9918 : 1
4	Val4	14.9126	1.2680	11.7607 : 1

Figure S2. a) Exemplary protein gel with fluorescent SYPRO staining for quantification of coat protein ratios using relative intensities. The circles represent the area integrated. **b)** Integration results.

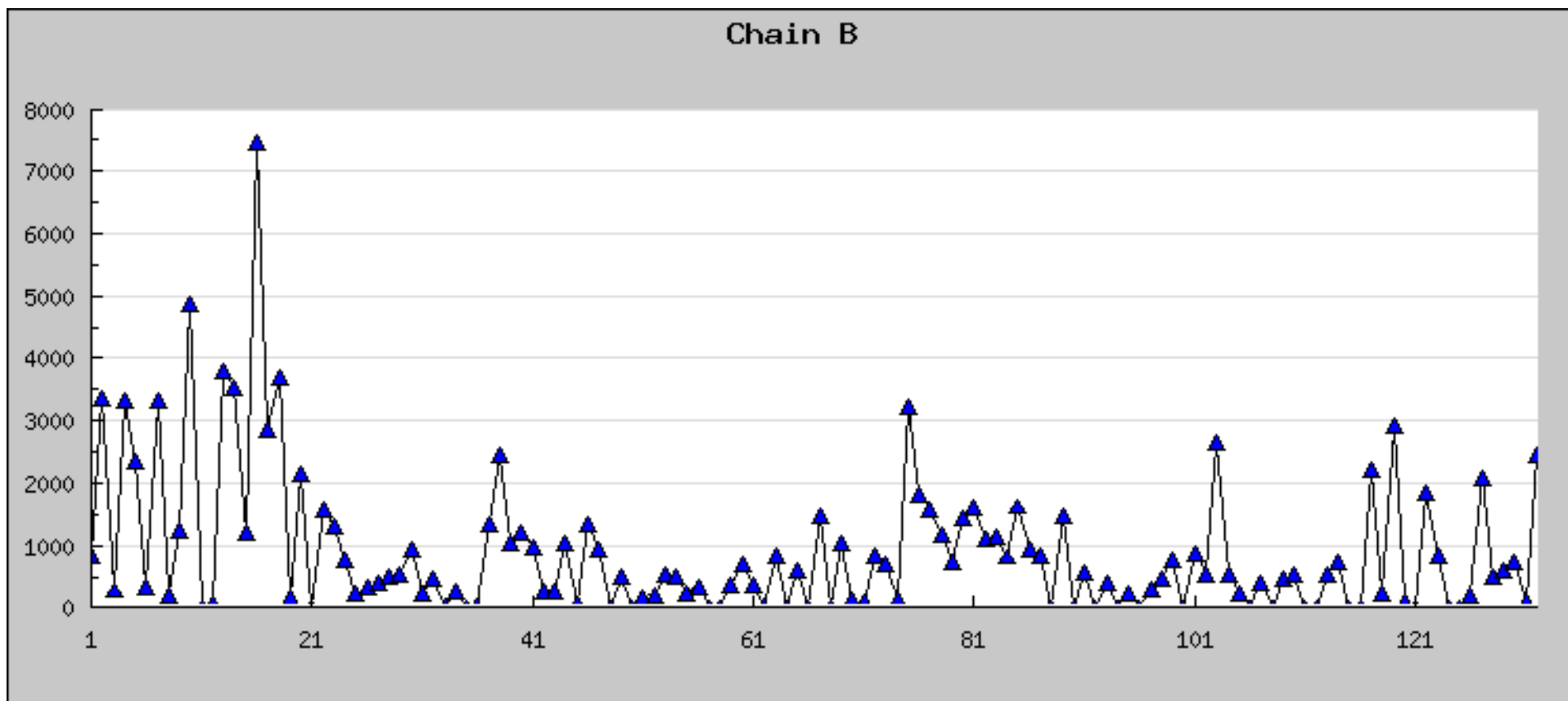


Figure S3. Calculated solvent accessibility profile for the Q β capsid protein. The figure is derived from <http://viperdbscripps.edu/splot1.php?VDB=1qbe>.

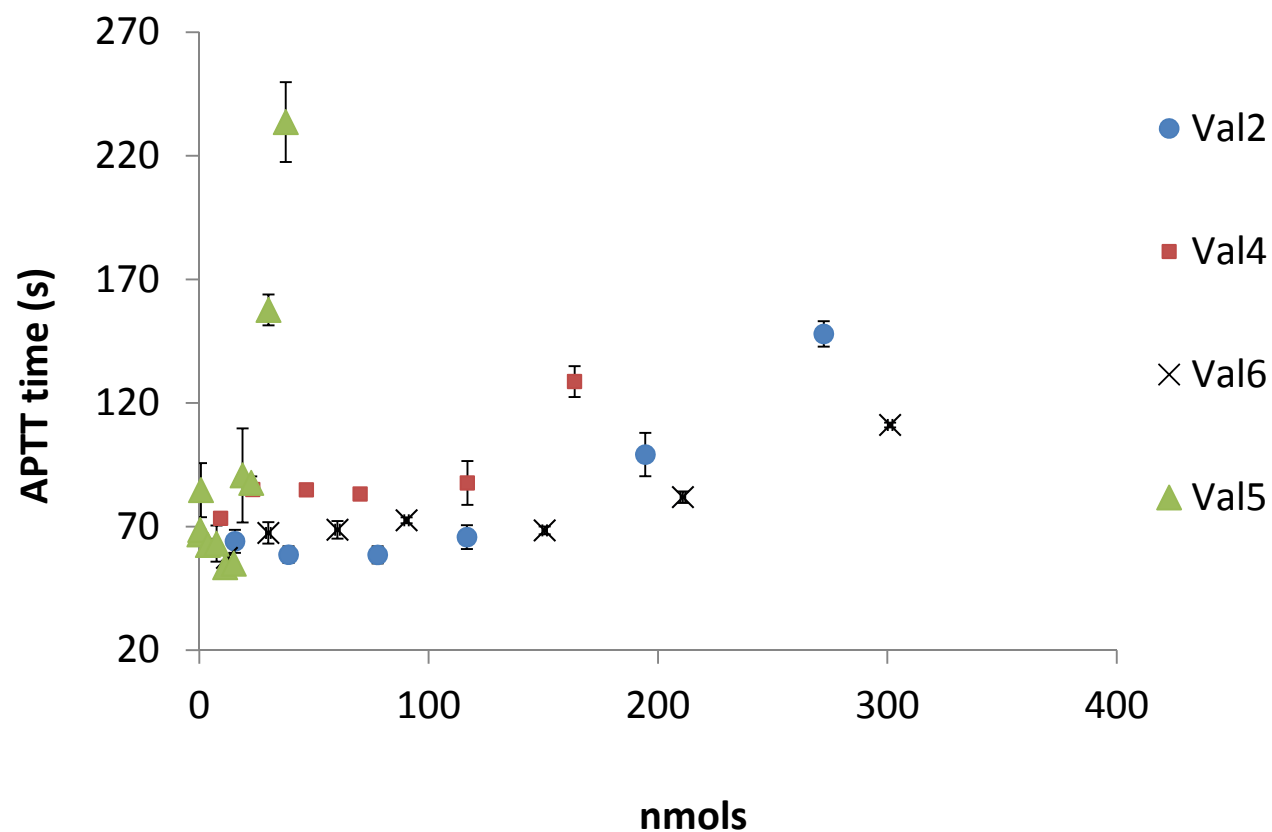


Figure S4. APTT clotting times in the presence of 45 ng of heparin using some of the synthesized co-expression peptides listed in **Table S1**. Data for the remaining peptides are in **Figure 3**.

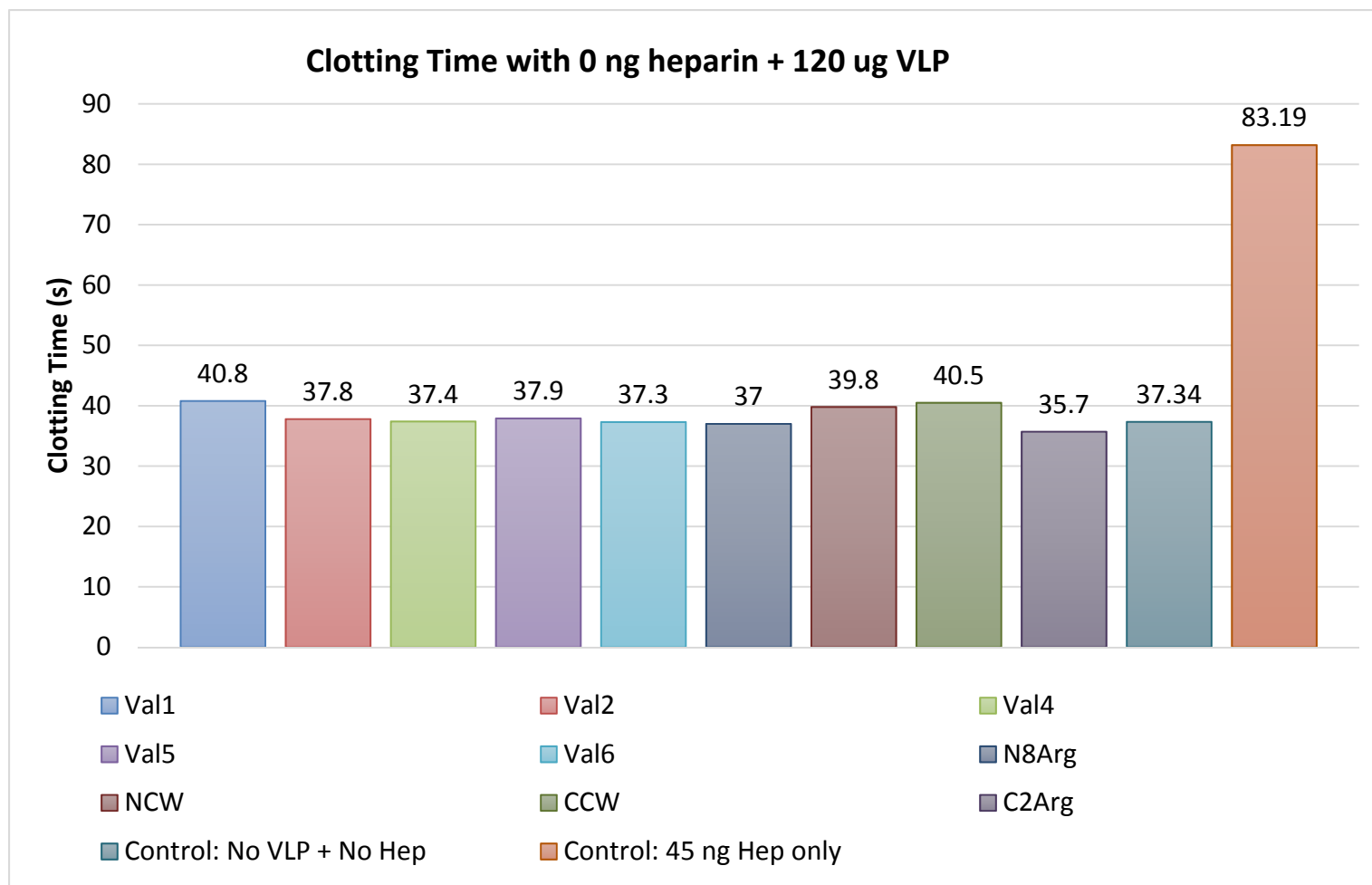


Figure S5. Clotting times from APTT assays for the various VLP constructs in the absence of heparin (Hep), with controls. All samples with VLP contain 120 μ g of protein.

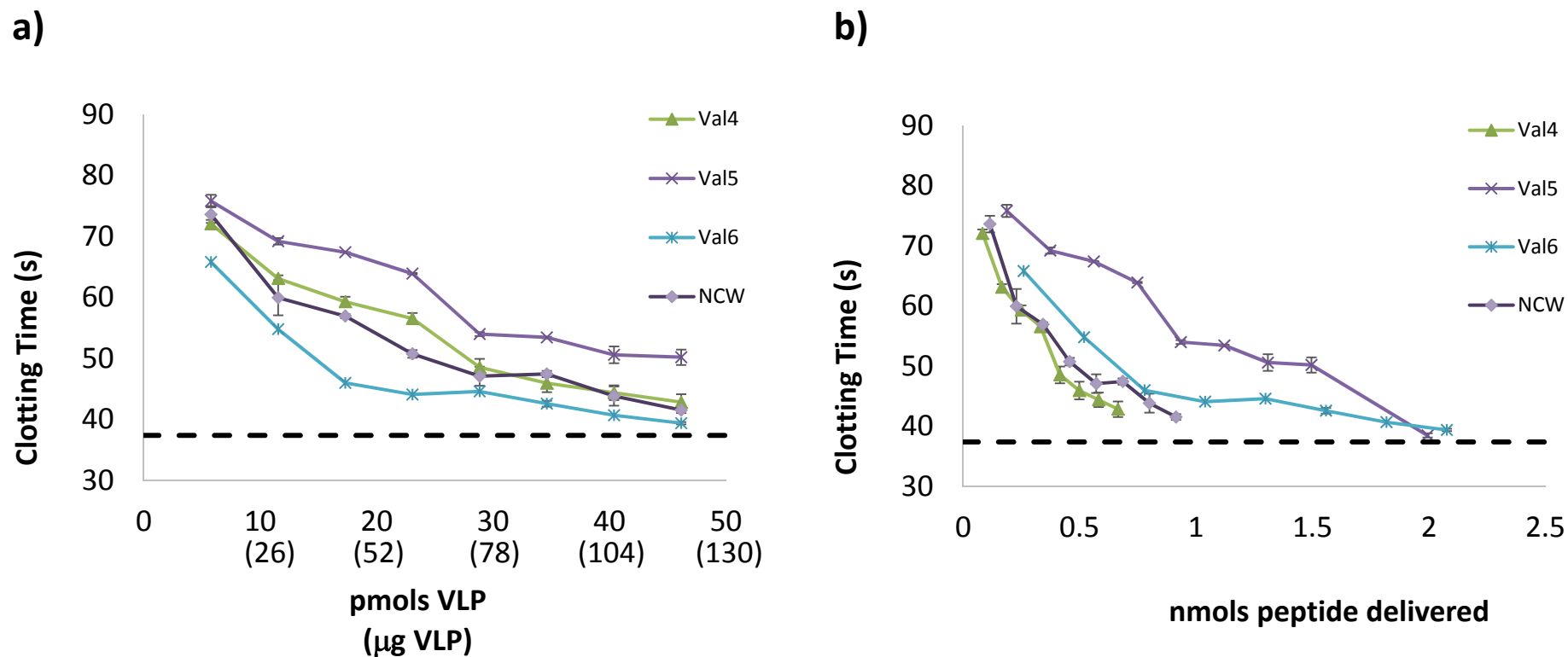
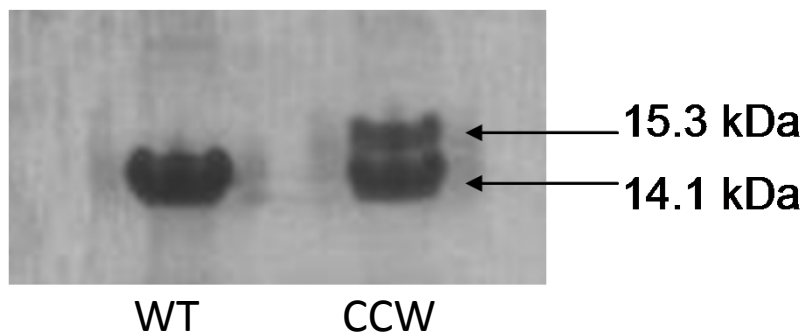


Figure S6. a) Clotting times from APTT assays in the presence of 45 ng of heparin for various VLP co-expression particles. The horizontal dashed line represents normal clotting time (no heparin). The conversion to mass of VLP was done using an average molecular weight of 2.6 MDa. **b)** The data in (a) are replotted in terms of peptide delivered by the VLP.

a)



b)

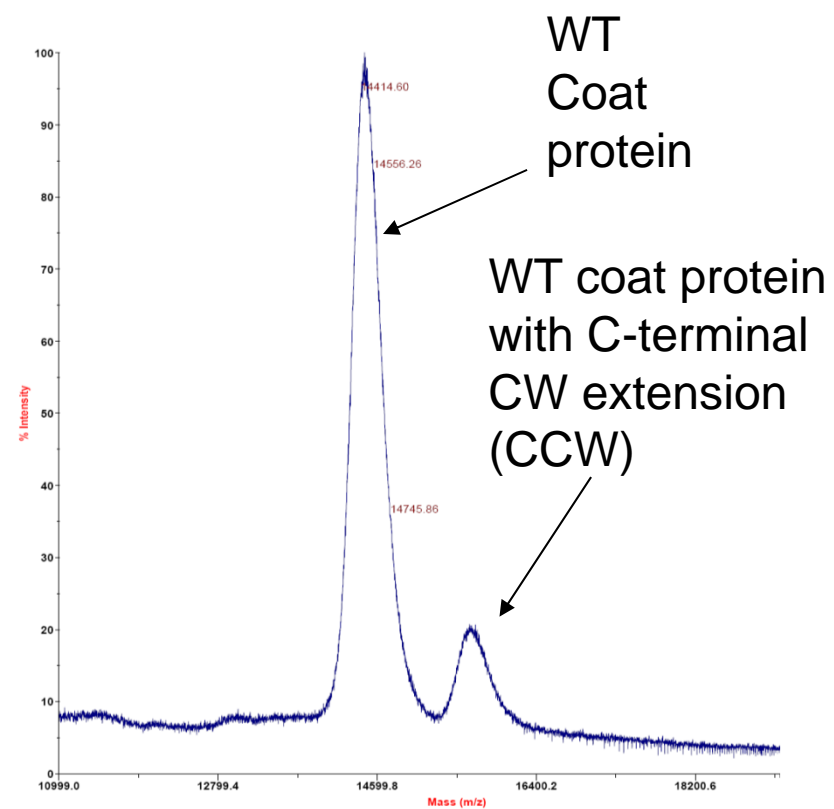


Figure S7. a) SDS-PAGE of CCW and wildtype Q β . **b)** MALDI-MS of CCW VLP.

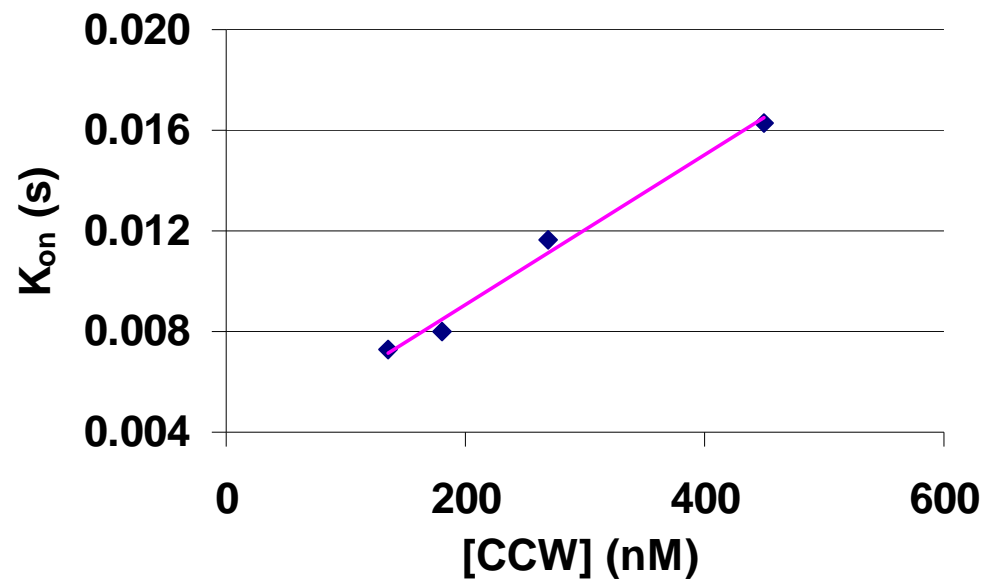


Figure S8. Preliminary results from dual polarization interferometry for CCW binding to heparin surfaces. The observed association rates for different concentrations are plotted. The dissociation constant is determined by dividing the dissociation rate (slope) by the association rate (y-intercept).