Table S1: Resonance assignments of HIV fusion domain bound to DPC micelles at 30 ^{o}C

Residues	N	N-H	αH	βH	Others
A1					
V2			4.25	2.168	γCH3, 1.028
G3	111.710	8.521	4.102 4.207		
I4	121.300	8.772	3.934	1.965	γCH2, 1.641, 1.352; γCH3, 0.990; δCH3, 0.958
G5	109.870	9.112	3.773 3.940		
A6	122.981	8.132	4.144	1.502	
L7	120.310	8.031	4.136	1.706 1.908	γH, 1.655; δCH3, 0.951, 0.914
F8	118.680	8.392	4.377	3.268	
L9	118.147	8.51	4.028	1.918 1.949	γH, 1.600; δCH3, 0.988, 0.964
G10	107.291	8.239	3.947		
F11	122.459	8.065	4.493	3.271	
L12	117.843	8.027	3.958	1.762 1.724	γH, 1.553; δCH3, 0.851, 0.834
G13	105.014	8.08	3.954 3.913		
A14	123.634	7.965	4.369	1.472	
A15	121.566	8.254	4.203	1.358	
G16	105.920	8.359	3.939		
S17	115.091	8.024	4.253		
T18	116.174	8.164	4.344	4.312	γCH3, 1.265
V19	120.323	8.031	4.106	2.185	γCH3, 1.022, 0.992
G20	110.759	8.412	3.975		
A21	123.556	8.084	4.344	1.488	
A22	122.426	8.303	4.392	1.46	
S23	114.254	8.21	4.475	?	

Table S2: *J*-couplings and derived dihedral ϕ angles

	$^3J_{HNH_\alpha}$ (Hz)	ϕ (deg)
G31	5.619755	-71.45819683
G32	5.264787	-68.65759599
I4	4.557218	-63.0802157
G51	5.433069	-69.98320457
G52	4.362239	-61.43080769
A6	3.88802	-57.3976381
F8	4.540984	-62.91670659
L9	4.543641	-62.91670659
G10	6.794122	-80.59802035
F11	4.41105	-61.84627794
L12	5.537031	-70.83777821
G13	6.723453	-80.03953307
A14	5.650999	-71.69067947
A15	5.271571	-68.73577612
G16	7.496879	-86.46020162
S17	6.082461	-75.02152597
T18	6.610053	-79.16680672
V19	1.963837	-32.17088443
G20	7.23212	-84.18026821
A22	5.755754	-72.54258992

$$^3J_{HN_\alpha} = 6.4\cos^2\theta - 1.4\cos\theta + 1.9$$

$$\theta = |\phi\text{-}60^o|$$

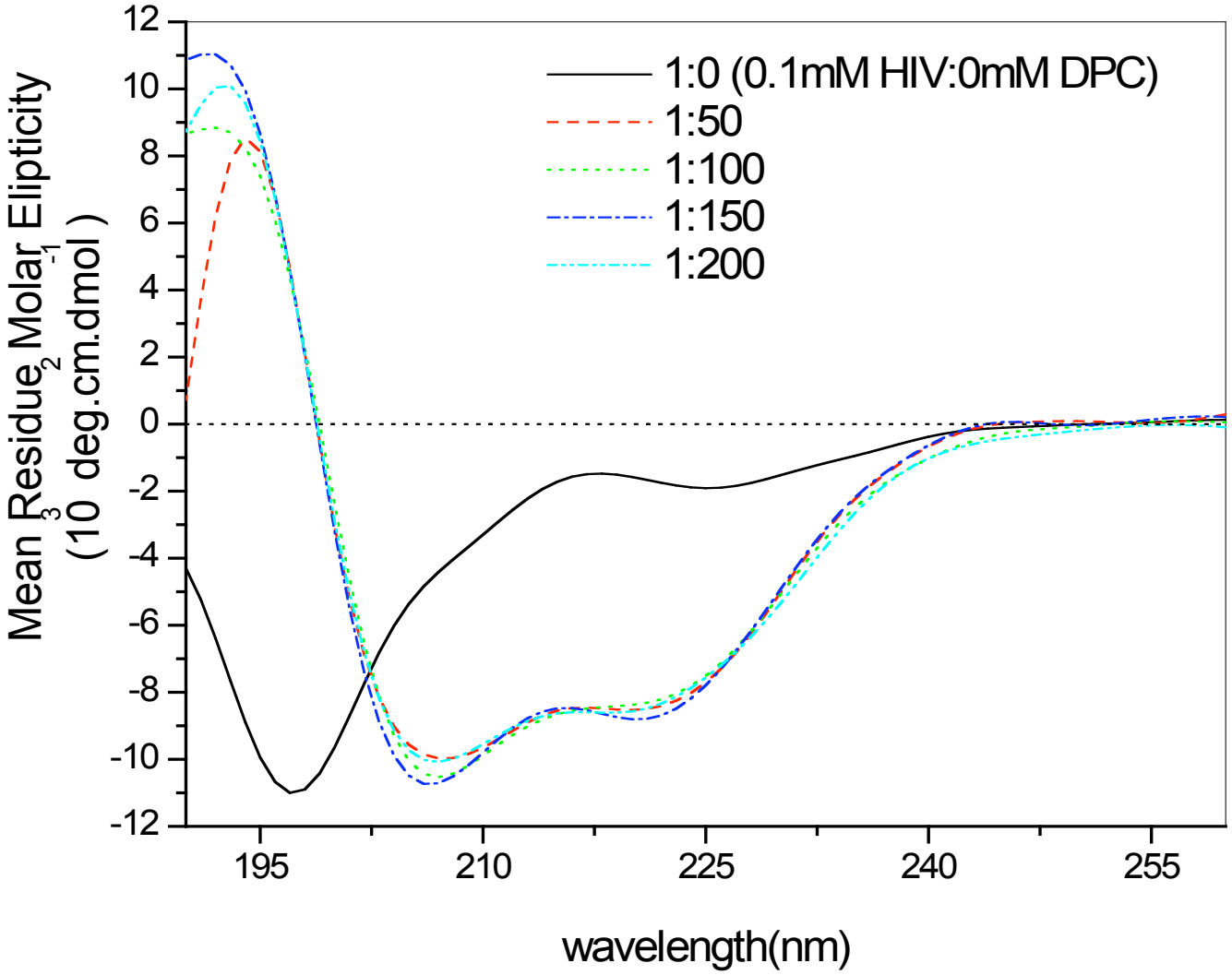

Figure S1A: CD spectra of the HIV fusion domain bound to DPC micelles at different protein-to-lipid ratios. The structure is not significantly changed by protein/lipid ratio in the 1:50 to 1:200 range.

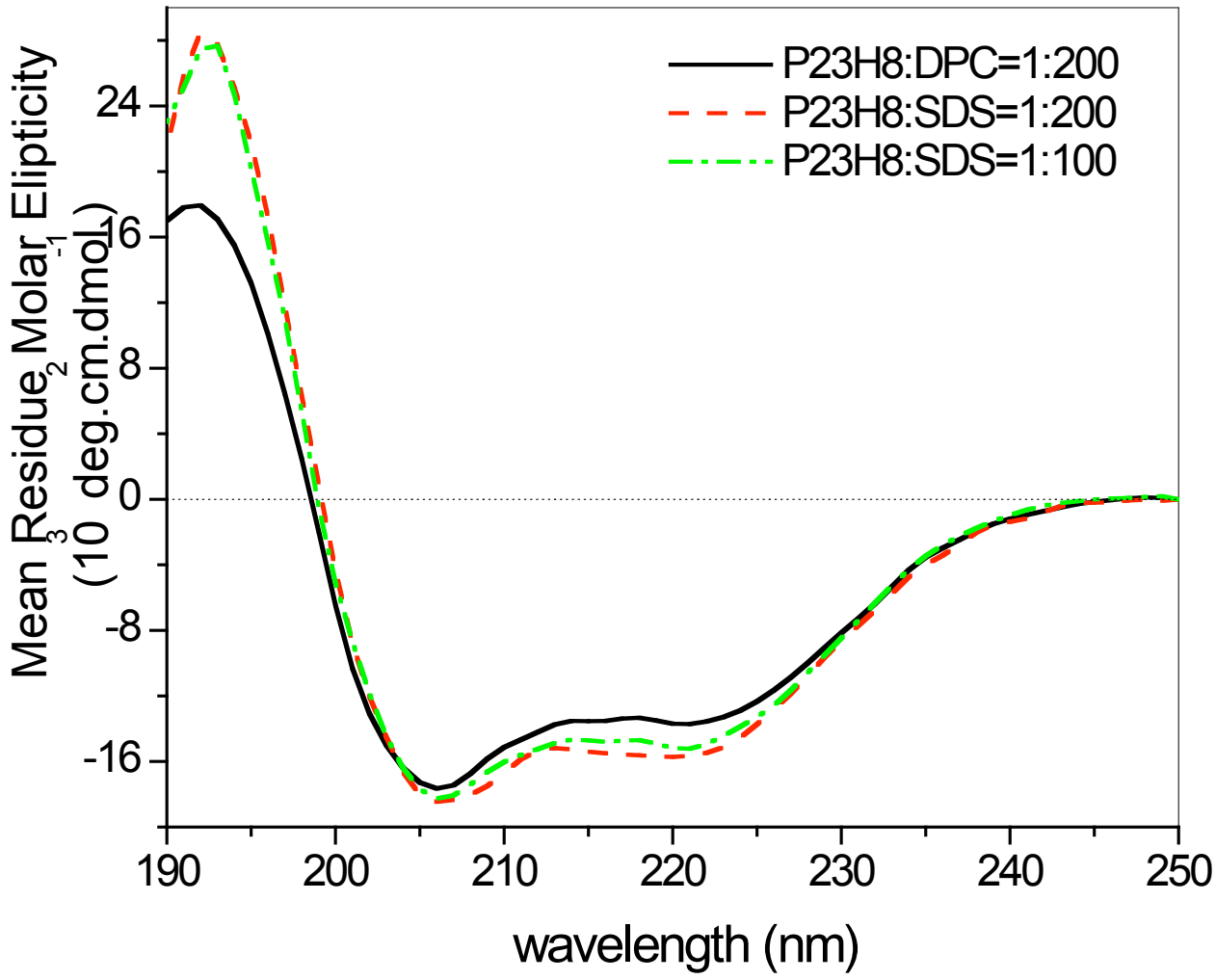

Figure S1B: CD spectra of the HIV fusion domain bound to DPC and SDS micelles at different protein-to-lipid ratios. The α-helical content in 1:200 SDS is 14 % greater than in 1:200 DPC.

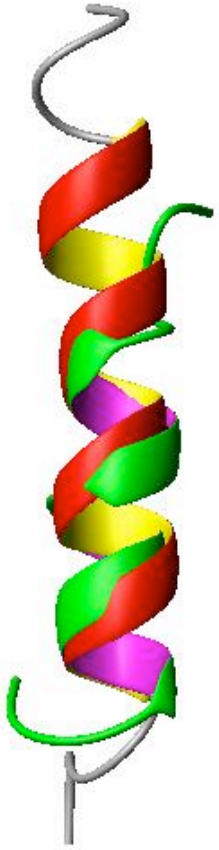

Figure S2: Overlay of NMR structures of the gp41 fusion domain determined in DPC micelles (green and pink, this work) and in SDS micelles (red and yellow, ref. 17).

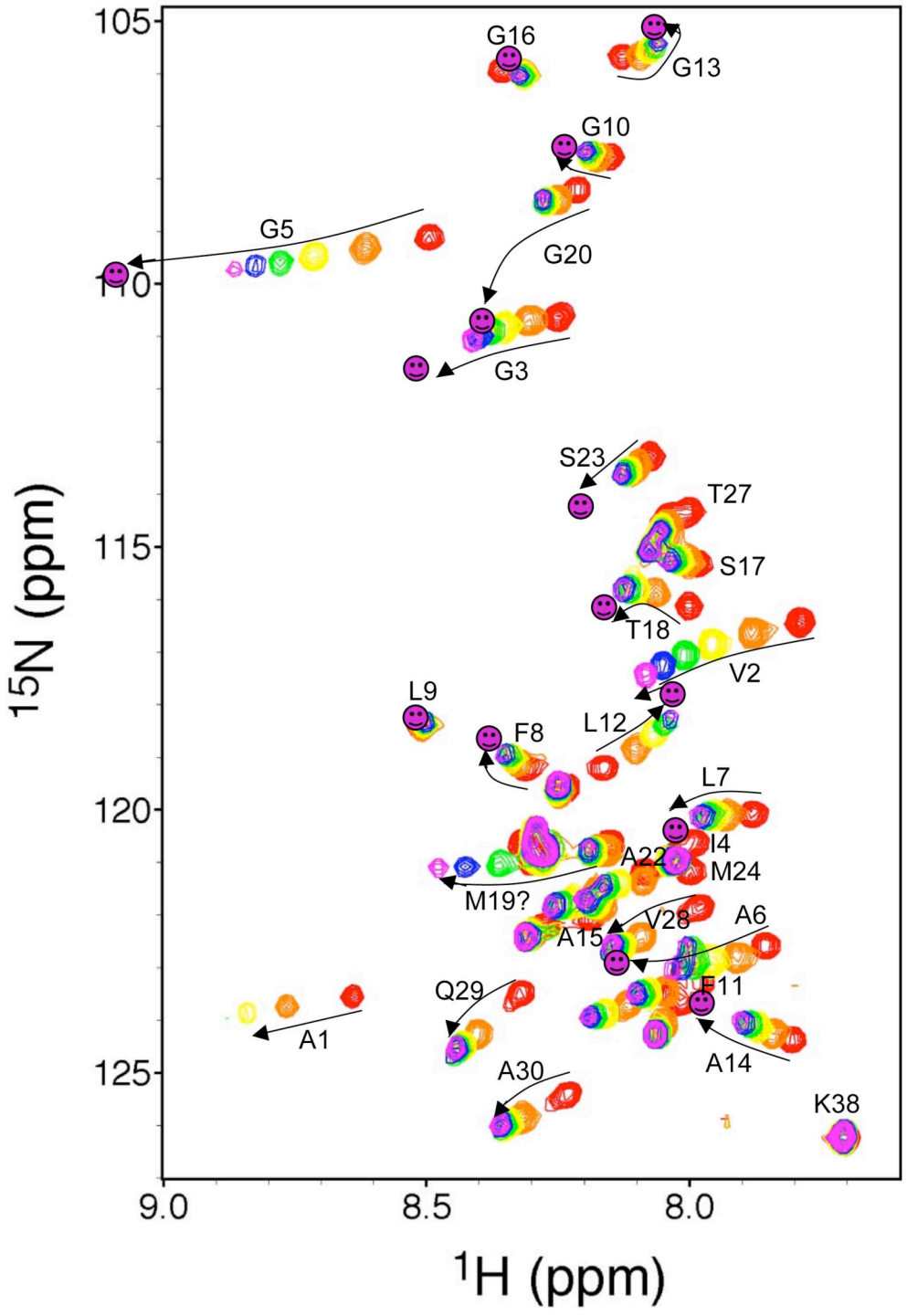

Figure S3: Comparison of chemical shifts of the gp41 fusion domain in DPC and SDS micelles. The HSQC spectrum in pure DPC micelles (purple smileys, this work) is overlaid on HSQC spectra of Jaroniec *et al*. (from Figure S3 of ref. 17, with permission) obtained in pure SDS (red) and increasing ratio DPC/SDS mixtures (orange to purple).

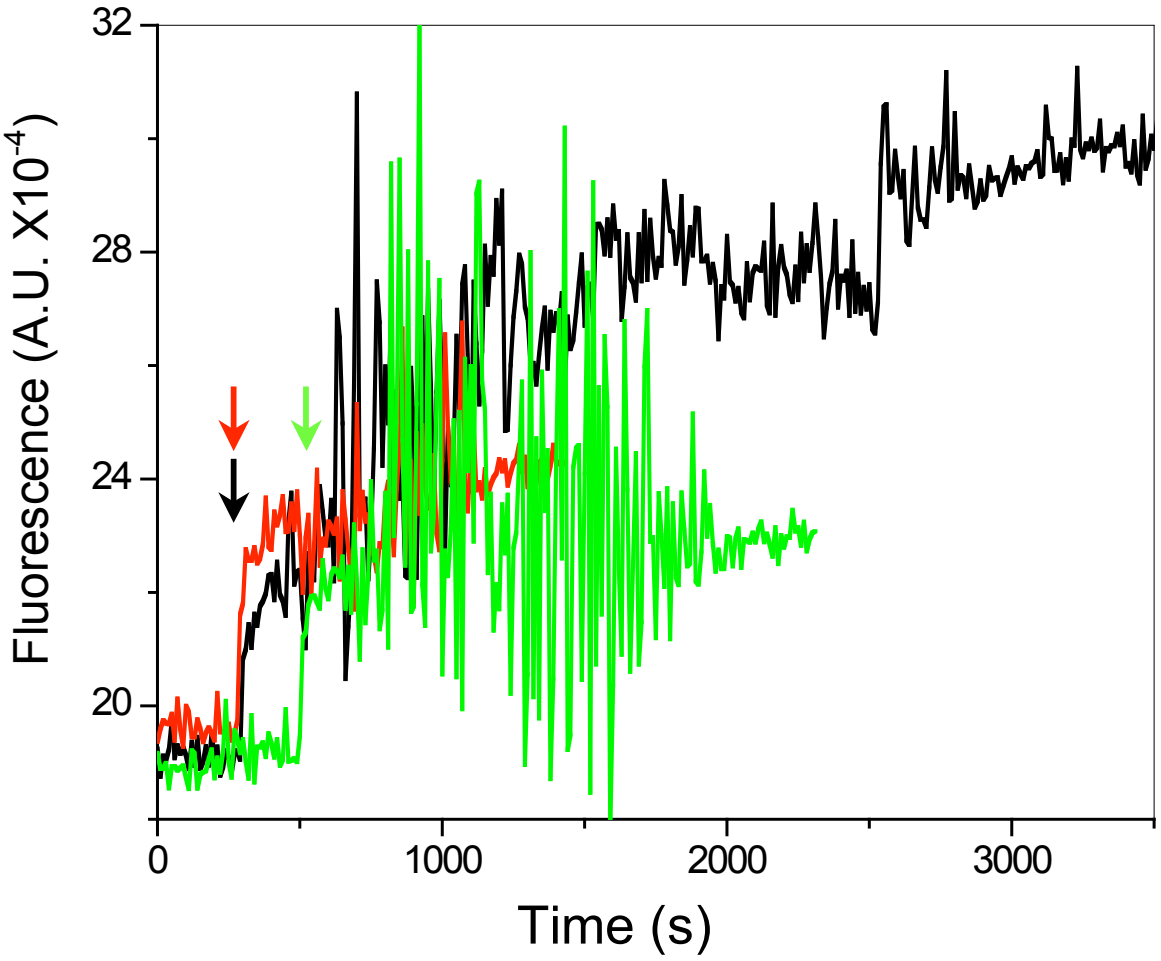

Figure S4: Fluorescence dequenching of liposomes containing 1 mol % NBD-PE and 1 mol % Rh-PE and an 9-fold excess of unlabeled liposomes (200 μM total) after addition of 7 (black), 10 (red), and 15 (green) μM P23H8 at arrows.