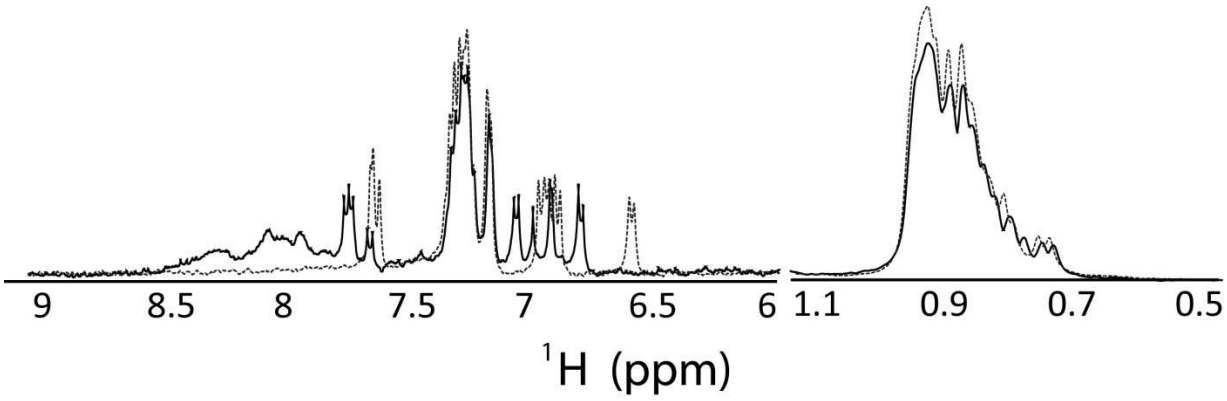
Supporting Information

S1 Spectral changes of $A\beta_{1\text{-}40}$ from basic to physiological pH

1D ^{1}H NMR spectra of $A\beta_{1\text{-}40}$ before (dotted line) and after (full line) adjustment to physiological pH.



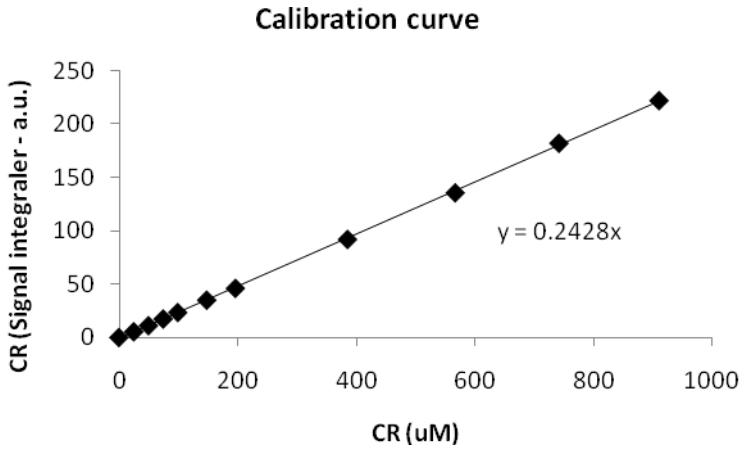
S2 Chemical shift assignments

Assignment of ^{1}H and ^{15}N chemical shifts for amide groups of $A\beta_{1\text{-}40}$ recorded at 800 MHz, 25 °C

Residue	^{15}N (ppm)	^{1}H CS (ppm)	Residue	^{15}N (ppm)	^{1}H CS (ppm)
E3	120.223	8.461	V24	120.352	8.117
R5	123.591	8.119	G25	111.591	8.529
D7	121.568	8.257	S26	115.561	8.164
S8	116.468	8.383	K28	121.656	8.336
G9	110.704	8.522	G29	109.445	8.413
Y10	120.031	7.952	A30	123.572	8.027
E11	122.461	8.403	I31	120.37	8.123
V12	120.809	8.051	I32	125.552	8.222
Q15	121.539	8.399	G33	112.68	8.431
K16	122.583	8.354	L34	121.653	8.02
L17	123.544	8.199	M35	121.703	8.417
V18	121.054	7.958	V36	121.857	8.183
F19	123.966	8.211	G37	112.826	8.547
F20	122.621	8.21	G38	108.752	8.254
A21	126.01	8.228	V39	119.829	8.054
E22	119.859	8.352	V40	128.085	7.779
D23	121.177	8.374			

S3 Congo Red calibration curve.

Signal intensity of CR peaks plotted as a function of CR concentration. The data has been fitted to a linear calibration curve, which subsequently was used to estimate the amount of free CR in solution.

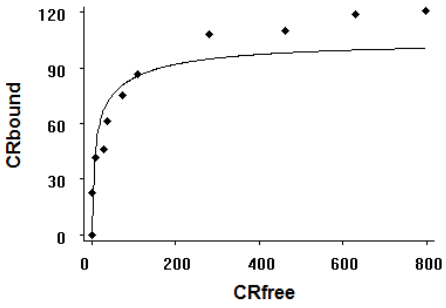
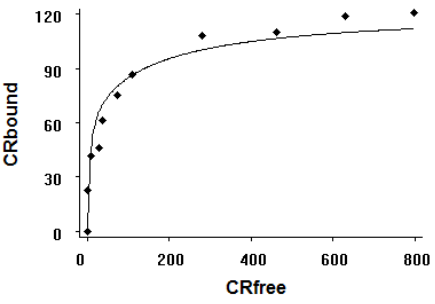


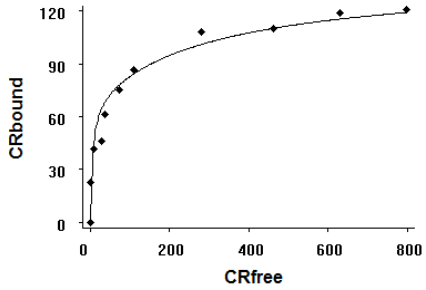
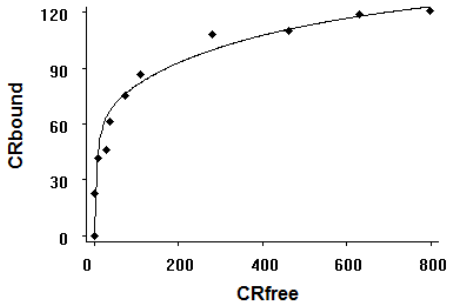
S4 simulations of second binding step using different binding stoichiometries (n_2)

Simulations of the total amount of bound CR have been carried out using the following equation describing a two-state binding:

$$[CR]_{bound} = \frac{n_1 \times [A\beta] \times [CR]_{free}}{K_{d1} + [CR]_{free}} + \frac{n_2 \times [A\beta] \times [CR]_{free}}{K_{d2} + [CR]_{free}}$$

K_{d2} was fitted for different values of n_2, while n_1 and K_{d1} were fixed at 1 and 5µM, respectively.

n_2	K_{d2}	Binding curve
0.5	90.7 ± 127.7	
0.75	180.2 ± 113.1	

1.0	319.7 ± 122.3	
1.25	498.8 ± 150.4	
1.5	698.8 ± 188.0