Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

Destabilization Potential of Phenolics on Aβ Fibril: Mechanistic Insights from Molecular Dynamics Simulations

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Fig. S1. Final configuration of Aβ with (a) water, (b) DHC, (c) EGT, and (d) GDE.

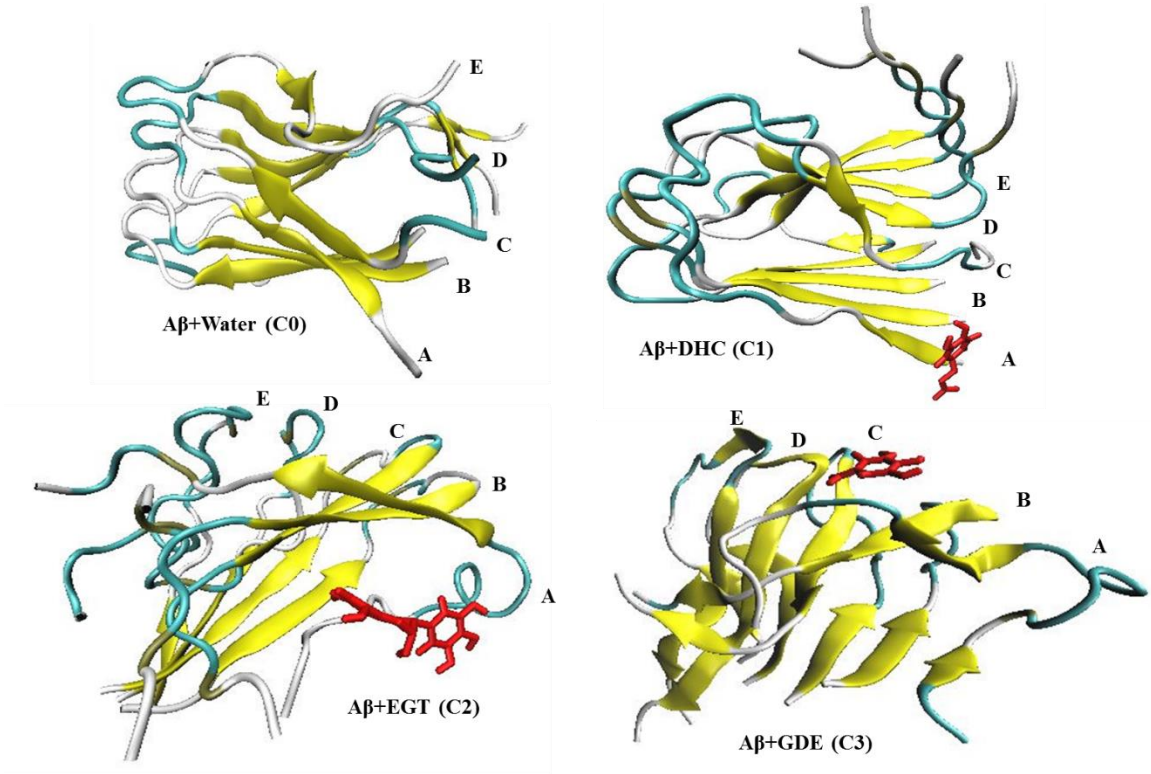

Fig. S2. (a) Average K28 Cα distance of chain D-E in water and all 4 ligands, and (b) Average D23-K28 distance of 2BEG in water and all 4 ligands.

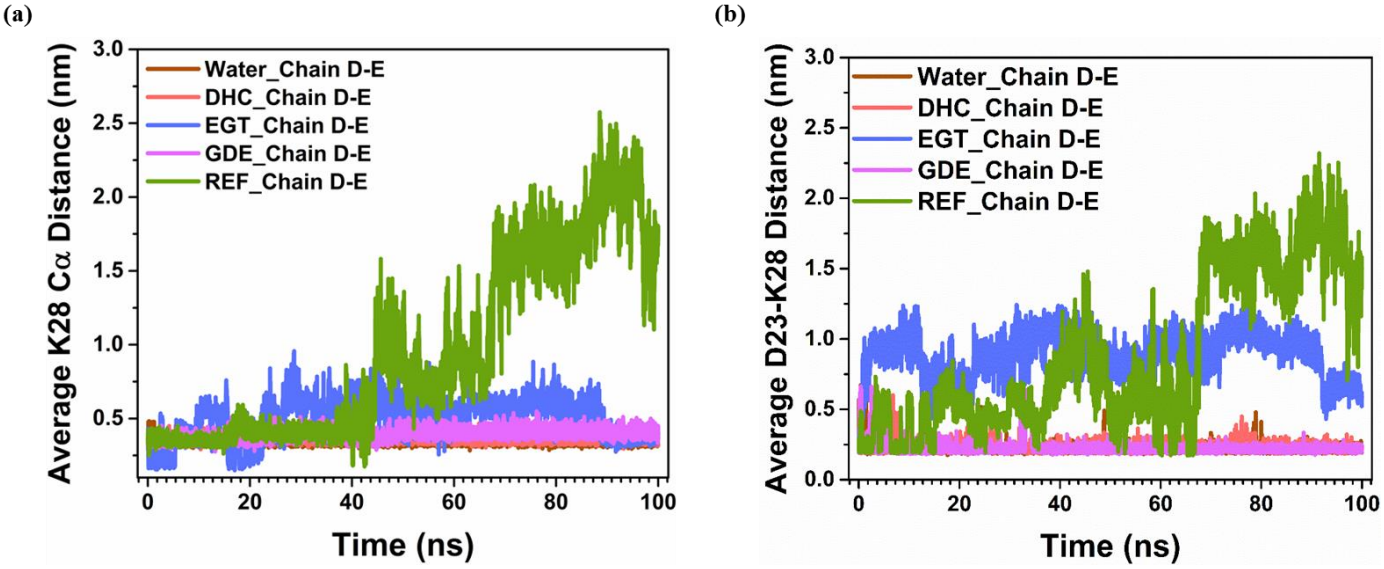

Fig. S3. Correlation between the theoretical and experimental NMR chemical shifts for Cα and Cβ atoms of $A\beta_{42}$ protofibril structure is shown in panel (a), and (b), respectively. The unit of NMR chemical shift is in ppm.

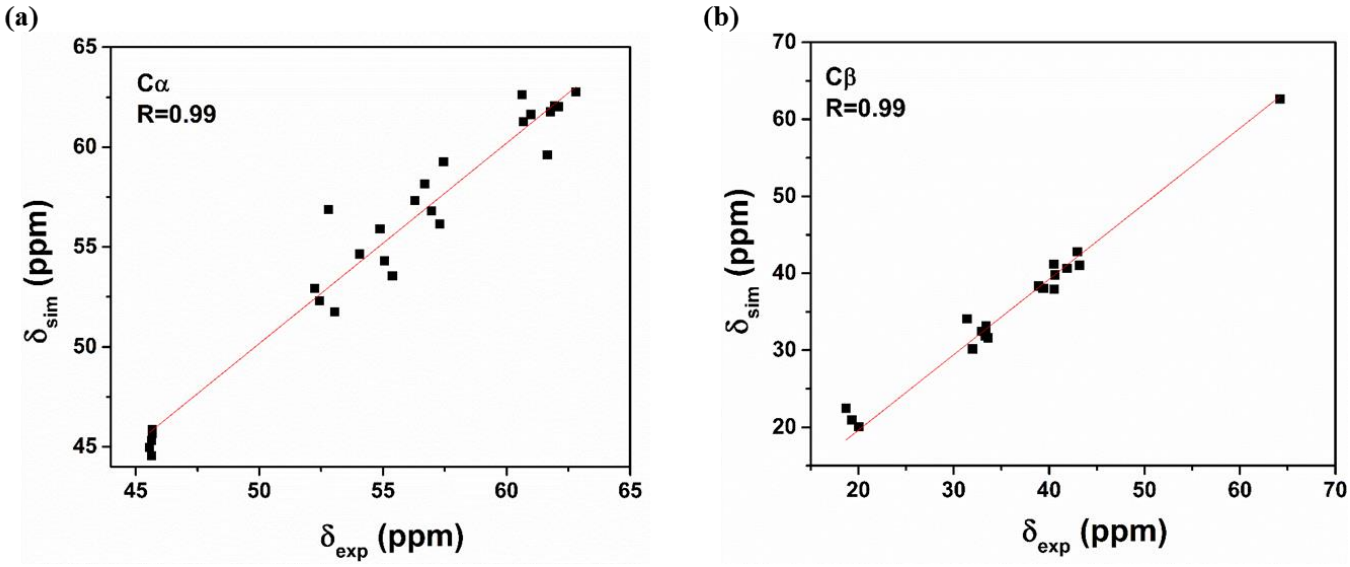

Fig. S4. Destabilization of Aβ fibril on addition of Ellagic acid by Average D23-K28 distance for all neighboring chains collectively Aβ-water and Aβ-REF system.

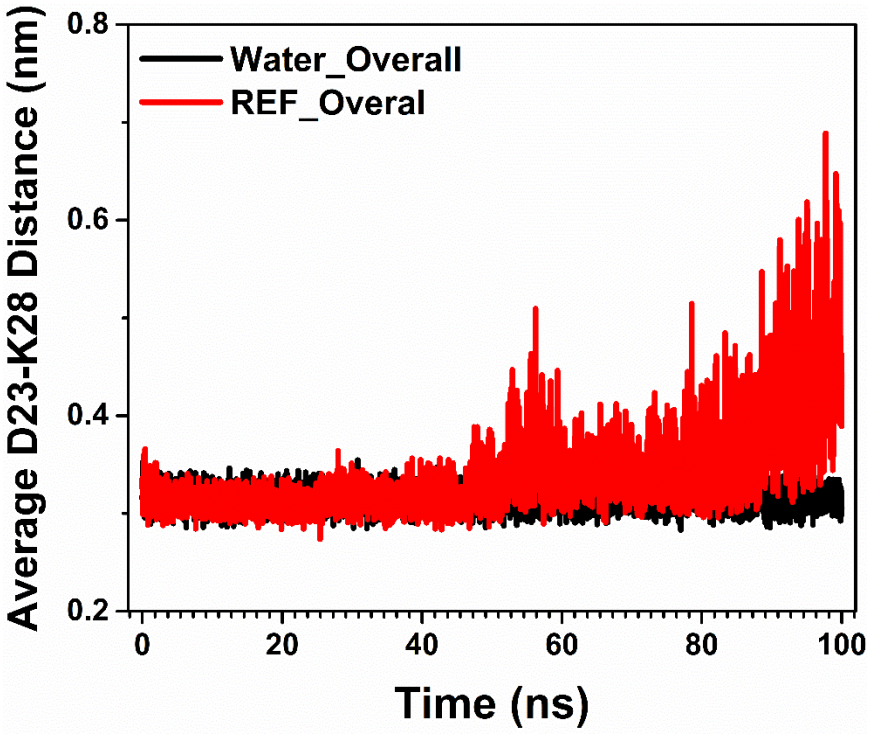

Fig. S5. Average D23-K28 distance for Aβ-water and Aβ-REF system (a) Within Chain A, and (b) Within Chain E.

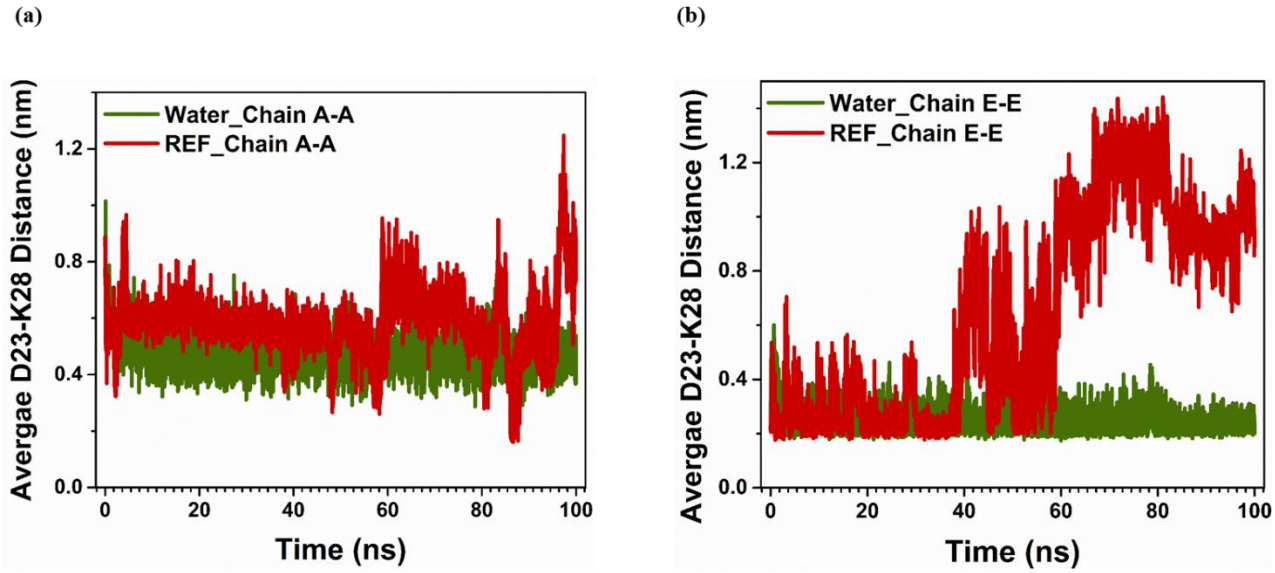

Fig. S6. Individual residue contribution to the total binding energy expressed in kcal/mol (a)- for the entire Aβ Fibril and (b)- Key residues which contribute the most to binding of DHC with chain A are indicated with a label in Orange.

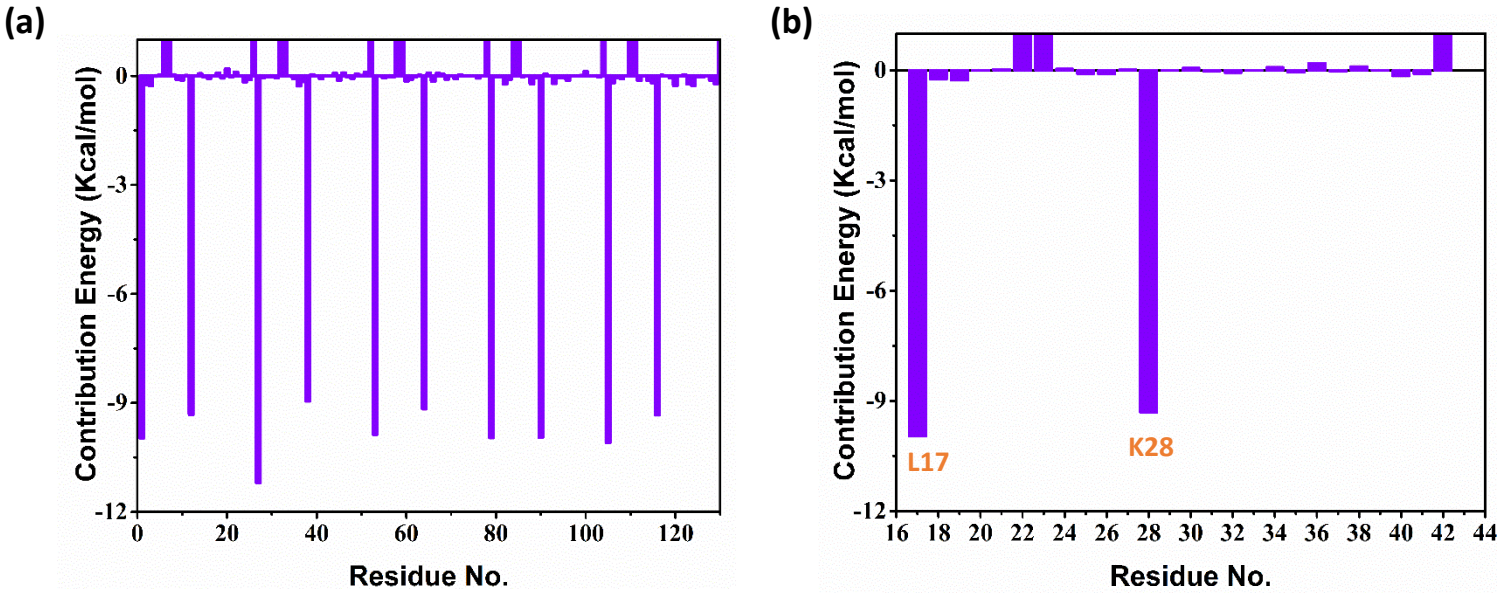

Fig. S7. Individual residue contribution to the total binding energy expressed in kcal/mol (a)- for the entire Aβ Fibril and (b)- Key residues which contribute the most to binding of EGT with chain A are indicated with a label in Orange.

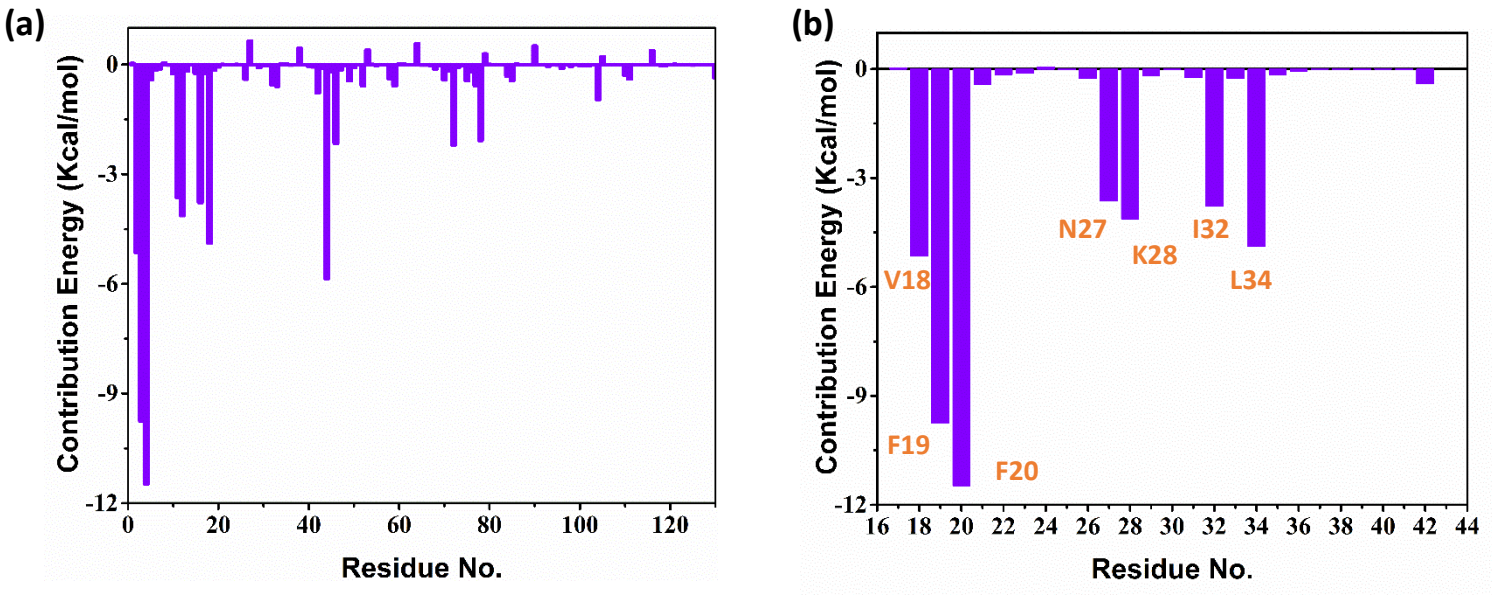

Fig. S8. Individual residue contribution to the total binding energy expressed in kcal/mol (a)- for the entire Aβ Fibril and (b)- Key residues which contribute the most to binding of GDE with chain A are indicated with a label in Orange.

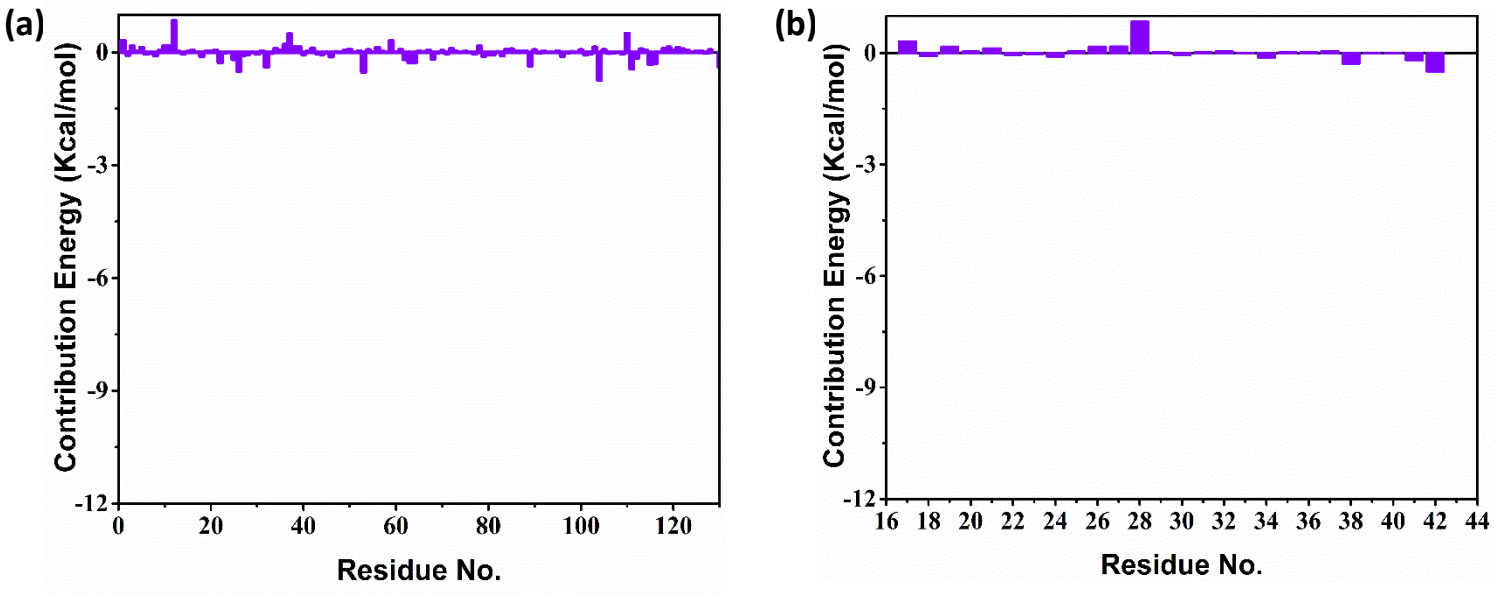

Table S1. Inter-chain binding free energy (Kcal/mol) for chain D and E for system Aβ-Water and Aβ-REF complex evaluated by MMPBSA method.

Energy Terms	Inter-chain (chain D and E) binding energy for Aβ-Water (Kcal/mol)	Inter-chain (chain D and E) binding energy for Aβ-REF (Kcal/mol)
ΔE_{vdW}	-333.26±2.03	-195.63±1.83
ΔE_{elec}	-272.51±1.48	-81.05±2.55
$\Delta E_{MM}{}^{a}$	-605.77±3.51	-276.68±4.38
ΔG_{ps}	443.99±1.38	198.10±0.00
ΔG_{nps}	-40.84±0.84	-23.92±0.77
$\Delta G_{solv}{}^{b}$	403.15±2.22	174.18±0.77
$\Delta G_{binding}{}^{c}$	-202.62±5.73	-102.50±5.15

[a] $\Delta E_{MM} = \Delta E_{vdW} + \Delta E_{elec}$

[b] $\Delta G_{solv} = \Delta G_{ps} + \Delta G_{nps}$

[c] $\Delta G_{binding} = \Delta E_{MM} + \Delta G_{solv}$