

Supporting information

Nucleoside-5'-phosphorothioate Analogues are biocompatible antioxidants Dissolving efficiently Amyloid Beta –Metal Ion Aggregates

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Cu⁺ titration of 1 mM A β ₂₈ solution monitored by ¹H-NMR

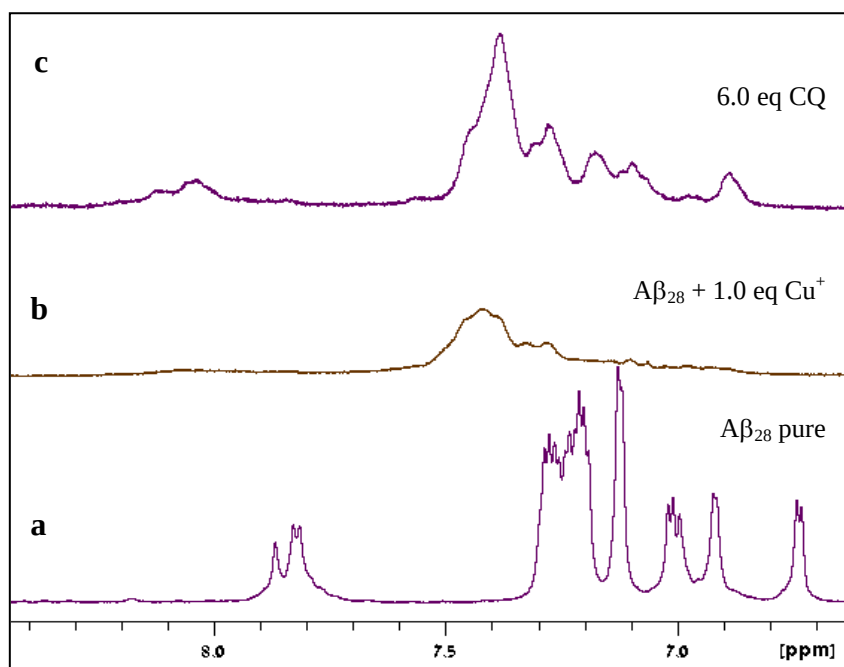


Fig. S1: A β ₂₈-Cu⁺ complex titrated by clioquinol (CQ). a: A β ₂₈ pure pH 7. b: A β ₂₈-Cu⁺ 1:1. c: A β ₂₈-Cu⁺-CQ 1:1:6.

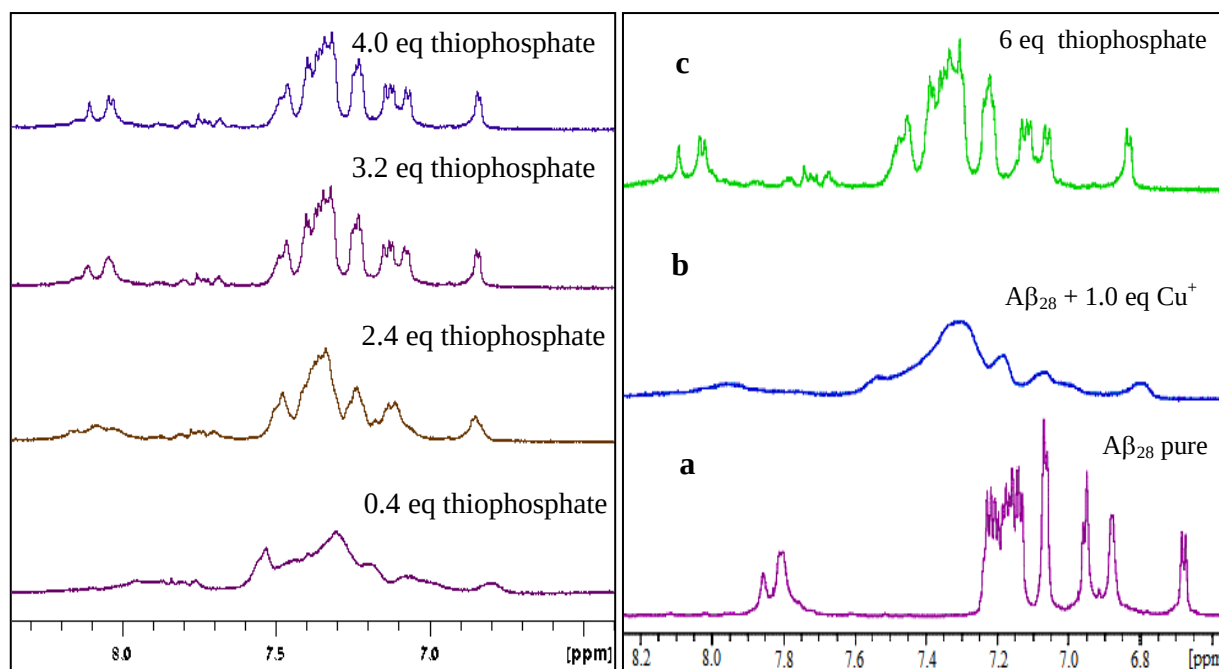


Fig. S2: A β ₂₈-Cu⁺ complex titrated by thiophosphate, 5,. a: A β ₂₈ pure pH 7. b: A β ₂₈-Cu⁺ 1:1. c: A β ₂₈-Cu⁺-thiophosphate 1:1:6.

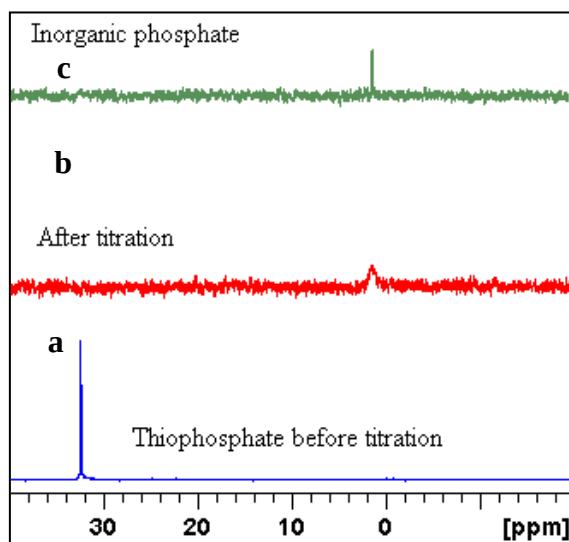


Fig S3: ^{31}P -NMR of thiophosphate, **5**, taken before and after the titration. a. thiophosphate before titration pD 6.93. b. after titration. c. Inorganic phosphate pD 6.9.

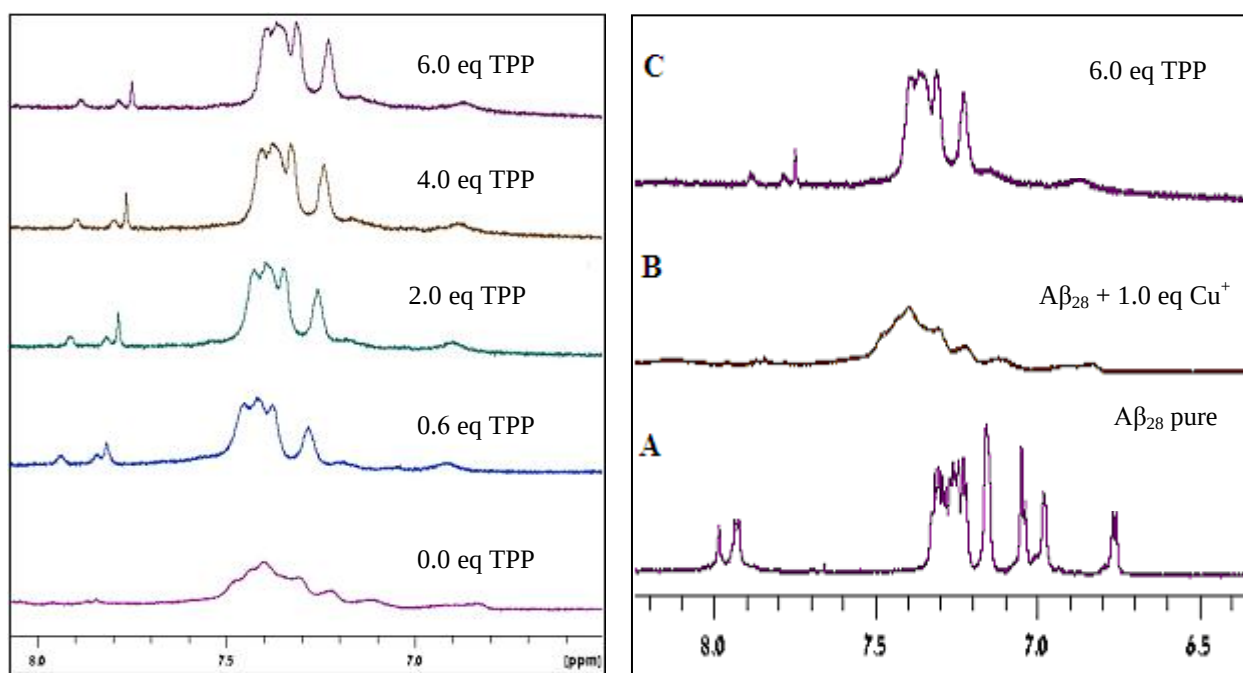


Fig. S4: $\text{A}\beta_{28}\text{-Cu}^+$ complex titrated by tripolyphosphate (TPP), **8**,. a: $\text{A}\beta_{28}$ pure pD 6.9. b: $\text{A}\beta_{28}\text{-Cu}^+$ 1:1. c: $\text{A}\beta_{28}\text{-Cu}^+\text{-TPP}$ 1:1:6 pD 6.8.

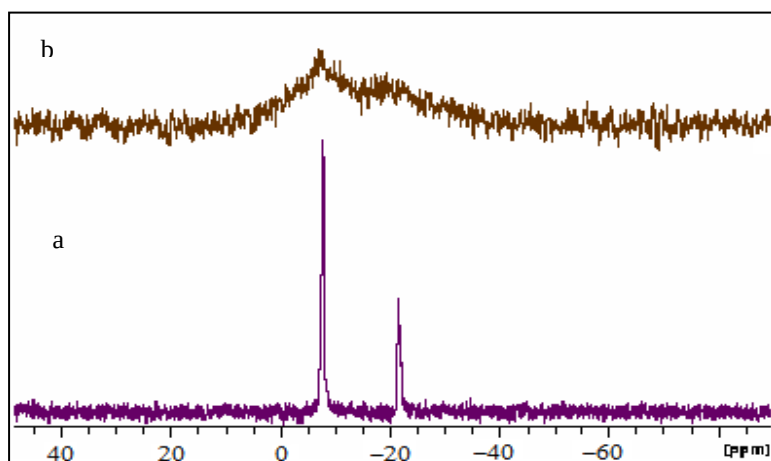


Fig S5: ^{31}P -NMR of tripolyphosphate (TPP), **8**, taken before and after the titration. a. TPP before titration pD 6.9. b. after titration pD 6.8.

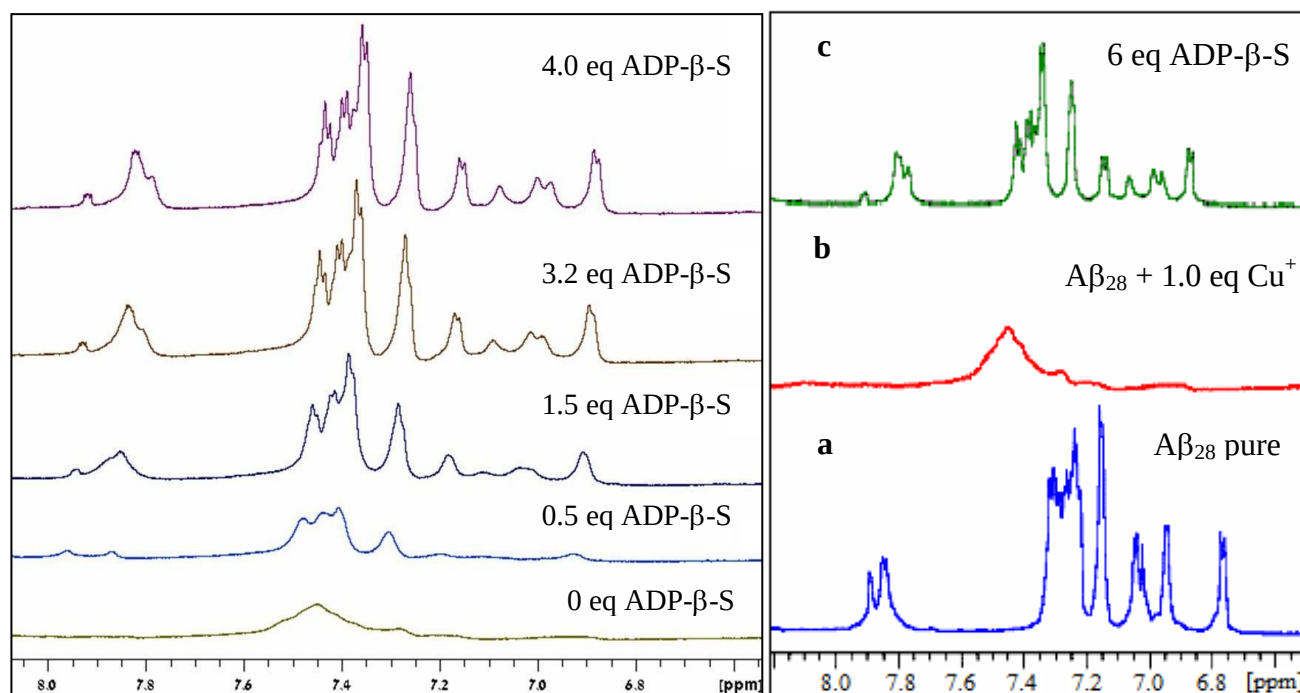


Fig. S6: $\text{A}\beta_{28}\text{-Cu}^+$ complex titrated by ADP- β -S, **6**,. a: $\text{A}\beta_{28}$ pure pD 7.2. b: $\text{A}\beta_{28}\text{-Cu}^+$ 1:1. c: $\text{A}\beta_{28}\text{-Cu}^+\text{-ADP-}\beta\text{-S}$ 1:1:5 pD 8.

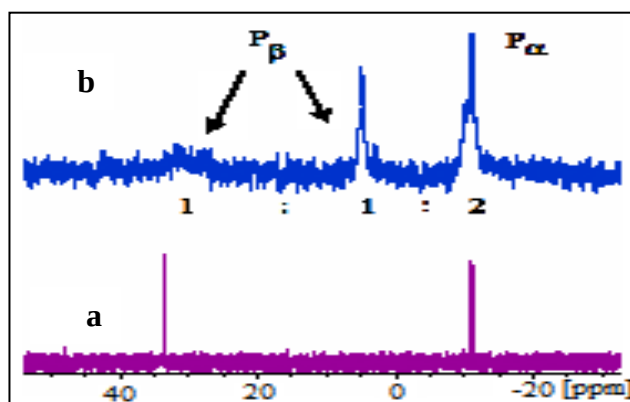


Fig S7: ^{31}P -NMR of ADP- β -S, **6**, taken before and after the titration. a. ADP- β -S before titration pD 7.2. b. after titration pD 8.

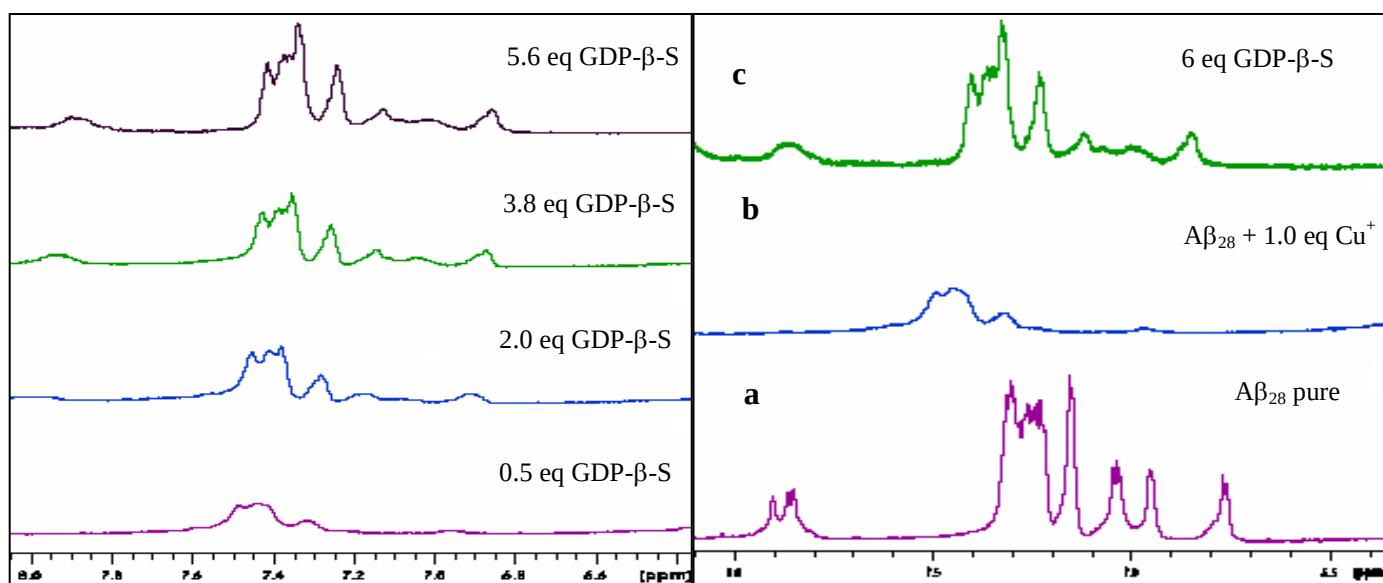


Fig. S8: $\text{A}\beta_{28}\text{-Cu}^+$ complex titrated by GDP- β -S, **9**,. a: $\text{A}\beta_{28}$ pure pD 7.3. b: $\text{A}\beta_{28}\text{-Cu}^+$ 1:1. c: $\text{A}\beta_{28}\text{-Cu}^+\text{-GDP-}\beta\text{-S}$ 1:1:6 pD 7.8.

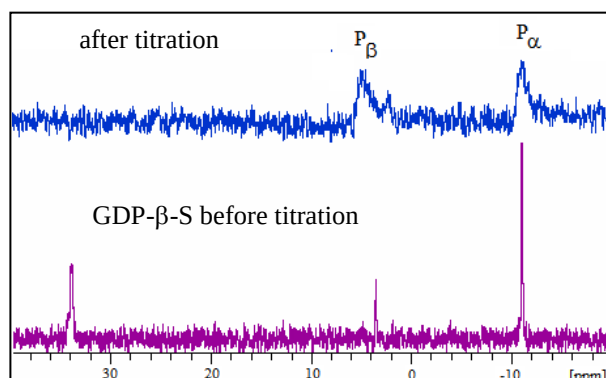


Fig S9: ^{31}P -NMR of GDP- β -S, **9**, taken before and after the titration. a. GDP- β -S before titration pD 7.3. b. GDP- β -S after titration pD 7.8.

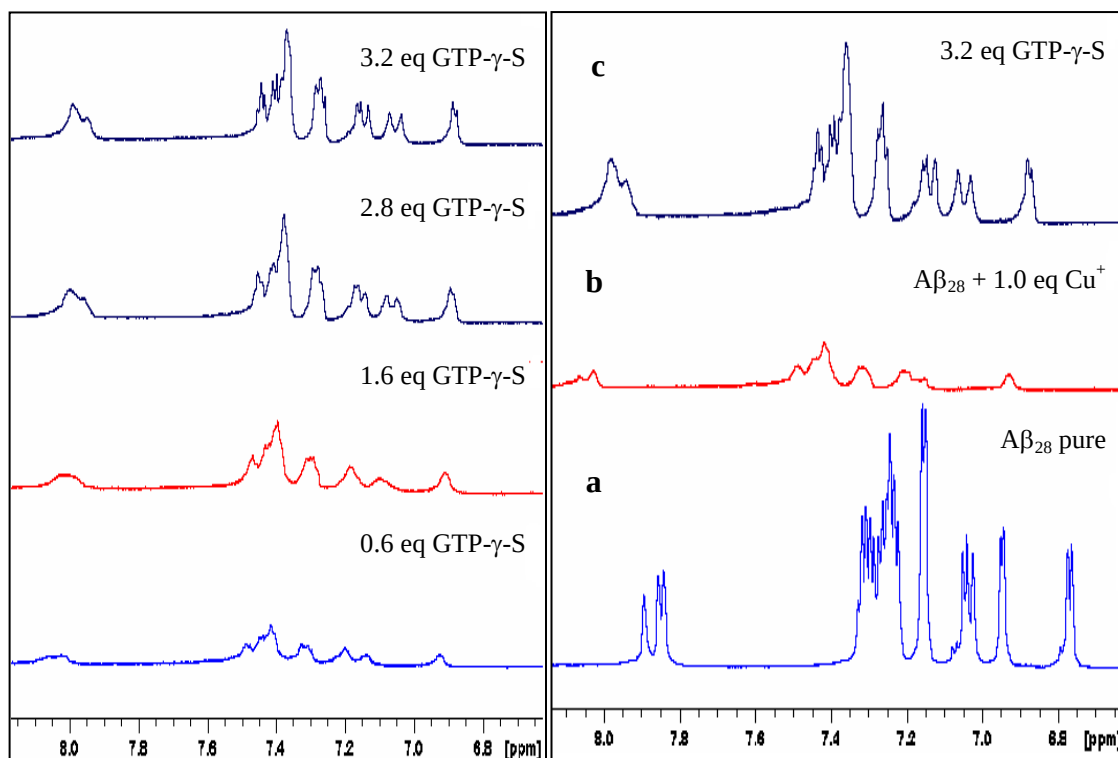


Fig. S10: A β_{28} -Cu $^+$ complex titrated by GTP- γ -S, **10**. a: A β_{28} pure pD 7.2. b: A β_{28} -Cu $^+$ 1:1. c: A β_{28} -Cu $^+$ -GDP- β -S 1:1:3.2 pD 7.4.

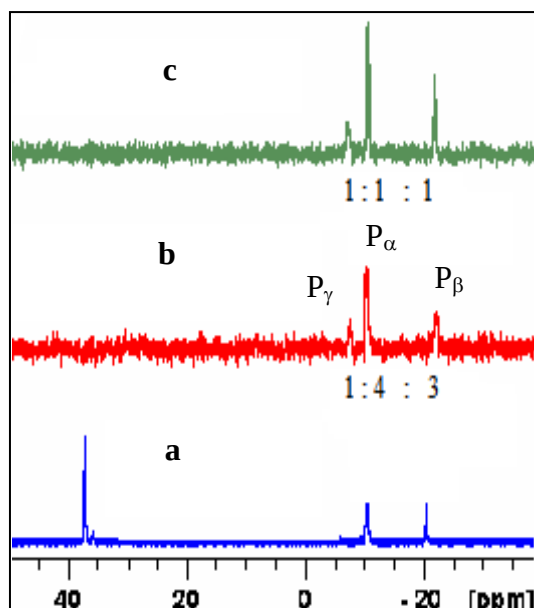


Fig S11: ^{31}P -NMR of GTP- γ -S, **10**, taken before and after the titration. a. GTP- γ -S before titration pD 7.2. b. GTP- γ -S after titration pD 7.4. c. Free GTP pD 7.4

Dynamic light scattering (DLS) measurements

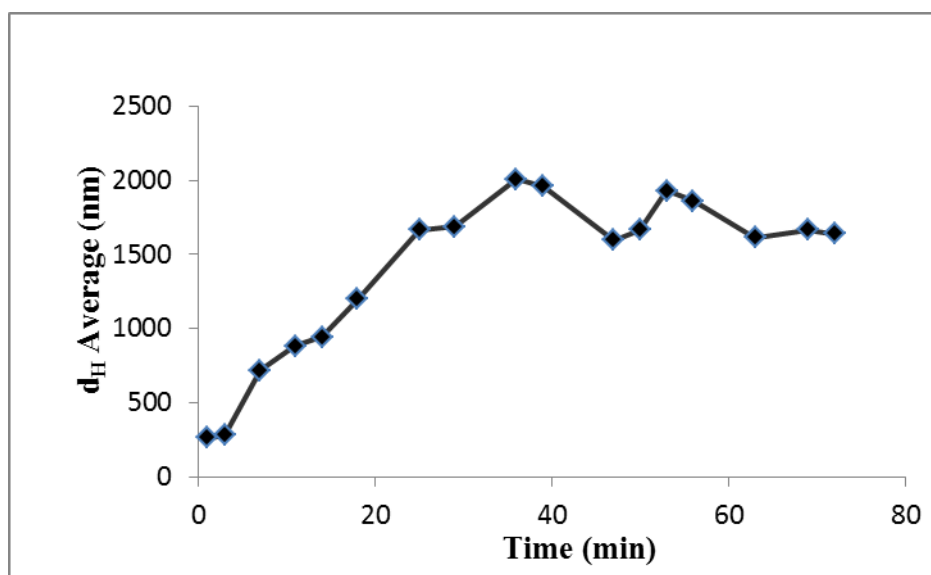


Fig S12: $\text{A}\beta_{40}\text{-Cu}^{2+}$ size by time DLS measurement.

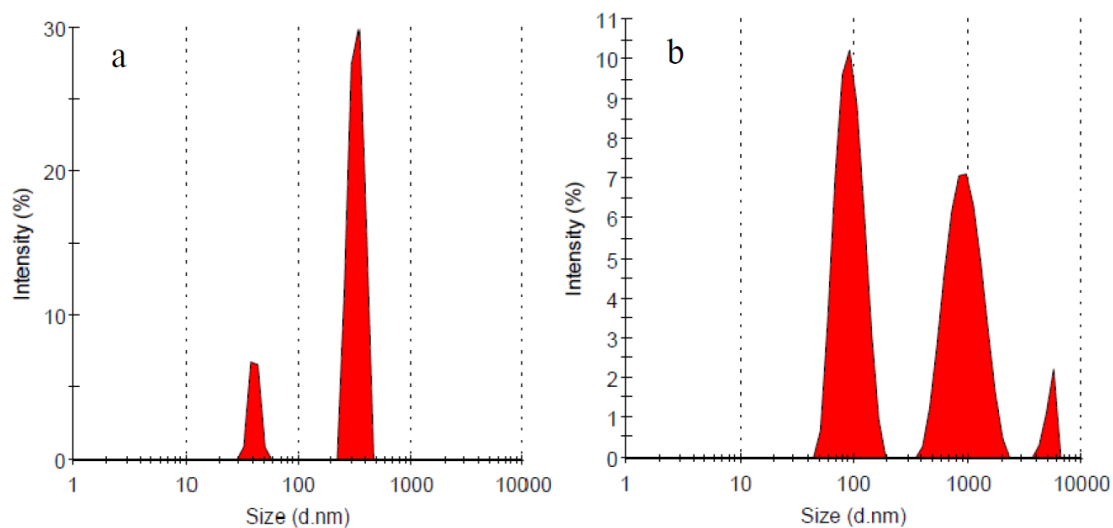


Fig S13: $A\beta_{40}\text{-Zn}^{2+}$ size DLS measurement: (a) after Zn^{2+} addition (b) after 45 min from Zn^{2+} addition.

Disaggregation of $A\beta_{42}\text{-M}^{2+}$ by various chelators as measured by turbidity assay at 405 nm.

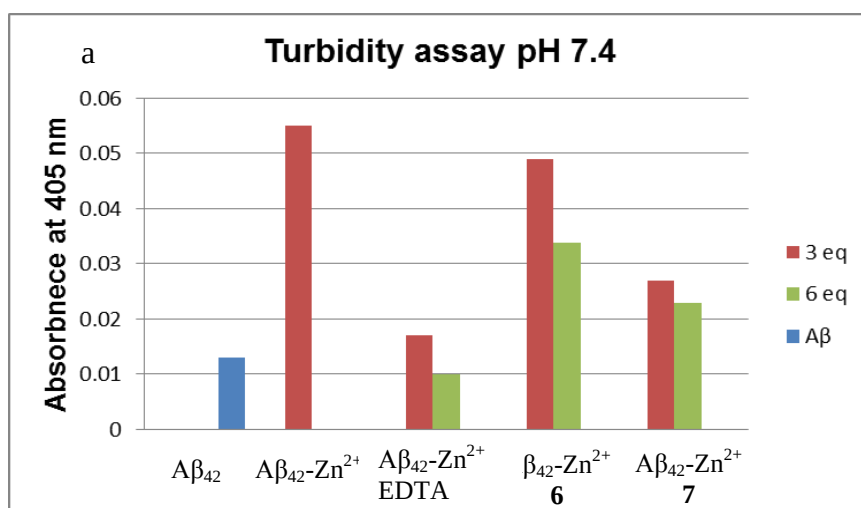


Fig S14: Chelator-depended changes of $A\beta_{42}\text{-Zn}^{2+}$ aggregates.

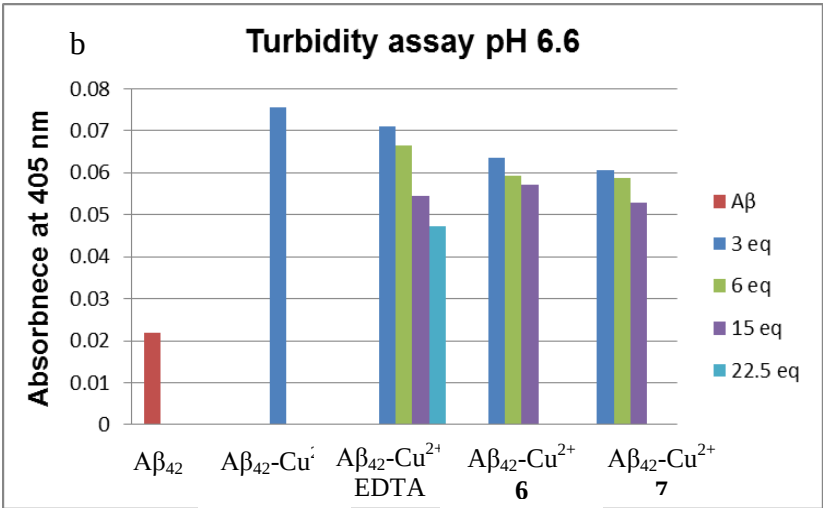


Fig S15: Chelator-depended changes of Aβ₄₂-Cu²⁺ aggregates.

Electron spin resonance (ESR) radical assay.

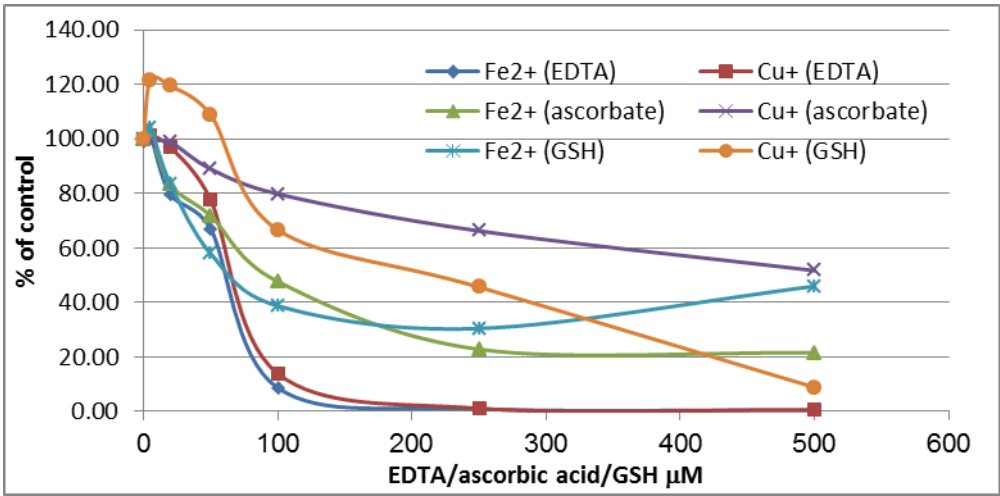


Fig S16: Inhibition of OH radical production by EDTA, ascorbic acid and GSH as percent of control.

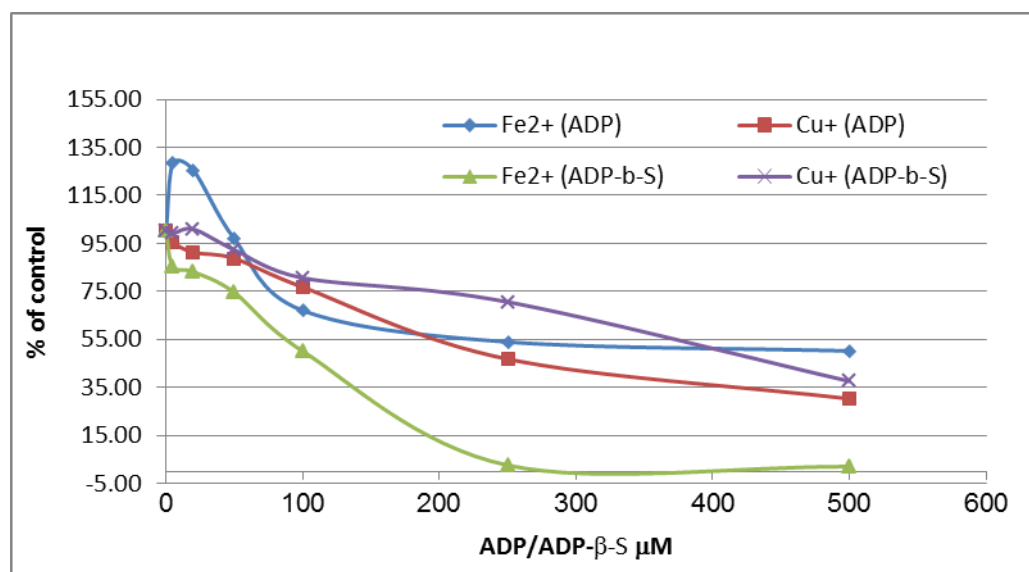


Fig S17: Inhibition of OH radical production by ADP, 4, and ADP-β-S, 6, as percent of control.

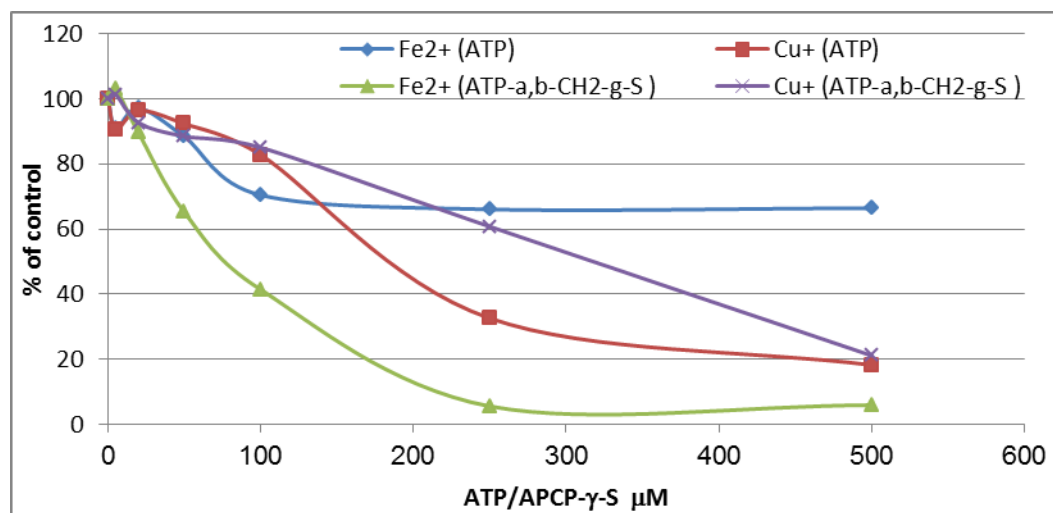


Fig S18: Inhibition of OH radical production by ATP, 1, and APCP- γ-S, 7, as percent of control.