

Electronic Supplementary Information (ESI)

Self-assembly of Cu (II) with Amyloid β_{19-20} Peptide: Relevant to Alzheimer's Disease

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Experimental Section

Materials: A β_{19-20} peptide (diphenylalanine, H-Phe-Phe-OH) was purchased from Bachem (Bubendorf, Switzerland). CuCl₂·2H₂O, EDTA, Tris were purchased from Sinopharm Chemical Reagent (Shanghai, China). All chemicals and reagents were of analytical grade used as received. Ultrapure water was used in all experiments.

Methods and characterization: UV-vis spectroscopies were performed on a Tu-1900 dual beam UV-visible spectrophotometer (Persee, Beijing, China). Fluorescence emission spectra were obtained using a Fluoro Max-4 spectrofluorometer (Horiba Jobin Yvon, New Jersey, USA). Microscopy images were obtained using VHX-1000 super depth of field three-dimensional Microscopy (Keyence, Osaka, Japan). Scanning electron microscopy images of A β_{19-20} -Cu(II) complex were obtained using S4800 SEM operating at 1.0 kV (Hitachi Limited, Tokyo, Japan).

Fresh solutions of the 3.2 mM A β_{19-20} were prepared by dissolving the lyophilized form in Buffer solution (10 mM Tris-HCl, pH 7.4). To avoid any pre-aggregation, fresh stock solutions were prepared for each experiment. The self-assembly of A β_{19-20} tubular structure and Cu(II)-A β_{19-20} microvesicles were obtained by placing 3.2 mM A β_{19-20} peptide and 1:1 molar ratio of Cu(II) to A β_{19-20} solution on glass slide and then keeping them still for 24 h. The same volume of 3.2 mM EDTA was added to Cu(II)-A β_{19-20} system to competitively binding Cu(II) from the microvesicles. The experiments were conducted at a constant temperature of 37 °C prior to morphology observation. The fluorescence titration spectra of A β_{19-20} with various molar ratio of Cu(II) were collected from 275 to 400 nm with excitation at 265 nm and slit width at 5 nm, respectively. The intrinsic fluorescence quenching experiments of A β_{19-20} by Cu(II) were performed at 20, 37 and 47 °C after being incubated for 0.5 h in 10 mM Tris-HCl, pH=7.4.

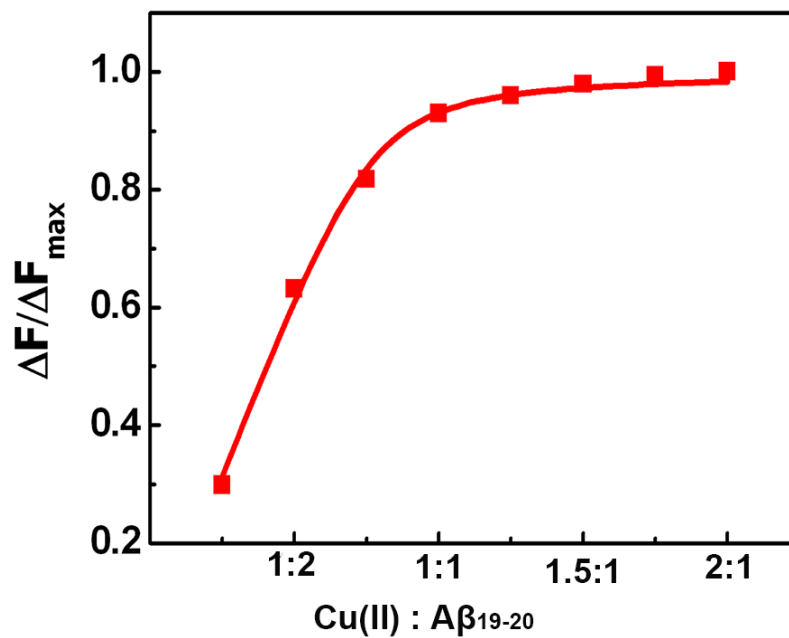


Figure S1 Nonlinear fitting curve of Aβ₁₉₋₂₀ peptide binding to Cu(II).

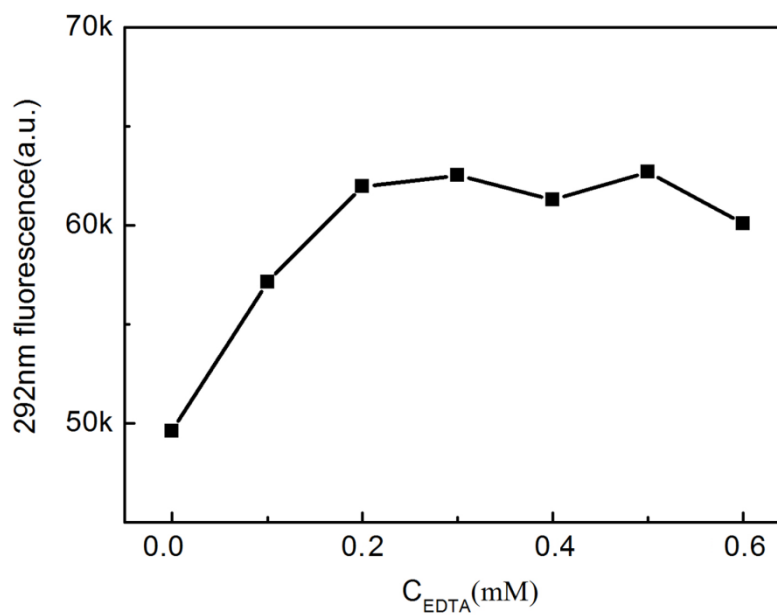


Figure S2 The effect of chelator EDTA concentration and (B) interaction time.

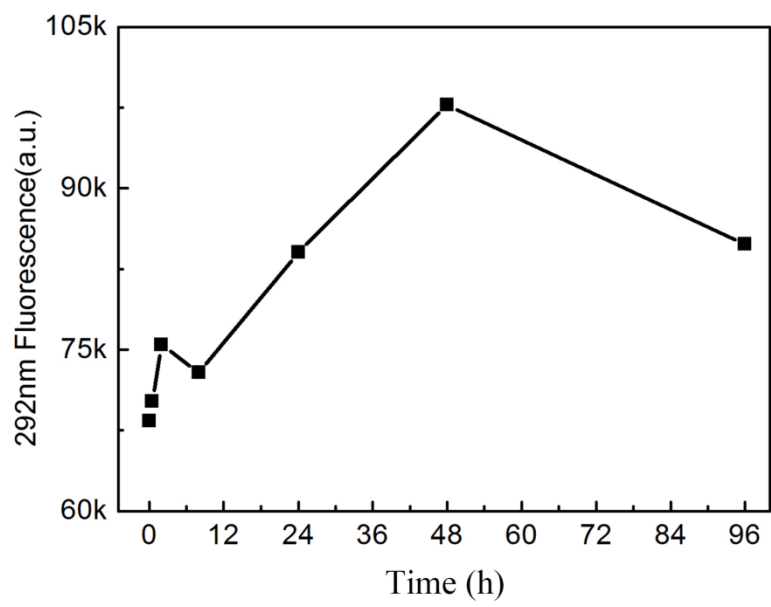


Figure S3 The effect of chelator EDTA interaction time.