Supplementary material

A sensitive aptasensor for detection of *β*-amyloid oligomers based on metal-organic frameworks as electrochemical signal probes

Yanli Zhou,[a,b]* Congming Li,[b] Xiaoqiao Li, [a] Xu Zhu,[a] Baoxian Ye,[b] and Maotian Xu [a,b]*

[a]Henan Key Laboratory of Biomolecular Recognition and Sensing, College of Chemistry and Chemical Engineering, Shangqiu Normal University, Shangqiu 476000, P. R. China

*e-mail: zhouyanli@mails.ucas.ac.cn; xumaotian@sqnu.edu.cn

[b]College of Chemistry and Molecular Engineering, Zhengzhou University, Zhengzhou 450001, P. R. China

Determination of dissociation constants

Shown in Fig. S1 are the fluorescence spectra of A*β* oligomers in 0.01 M PBS (pH 7.0) containing different amounts of aptamers A*β* oligomers. The fluorescence spectrum displays a peak at 303 nm with respect to tyrosine, and the fluorescence intensity decreased upon the addition of the aptamers because the complex of A*β* oligomers with aptamers produced the fluorescence quenching. The dissociation constants (K_d) for the complex were determined from the fluorescence intensity as a function of the concentration of aptamer, based on the following equation [1]:

$$\frac{F_0 - F_L}{F_0 - F_\alpha} = \frac{([L]+[M_0]+K_d)-[([L]+[M_0]+K_d)^2 - 4[M_0][L]]^{1/2}}{2M_0}$$

Where F_0 and F_L are the fluorescence intensities of the Aβ oligomers at 303 nm before and after the addition of aptamers, respectively. F_α is the minimum value of the intensity in the presence of aptamer. [L] and [M_0] are the concentration of aptamer and Aβ oligomer, respectively. Thus, the K_d could be calculated to be about 32 nM, which is consistent with the results in the literature [2].

[1] N. C. Maiti, D. Jiang, A. J. Wain, S. Patel, K. L. Dinh, F. M. Zhou, J. Phys. Chem. B 2008, 112, 8406–8411.

[2] K. Tsukakoshi, K. Abe, K. Sode and K. Ikebukuro, *Anal. Chem.* 2012, **84**, 5542–5547.

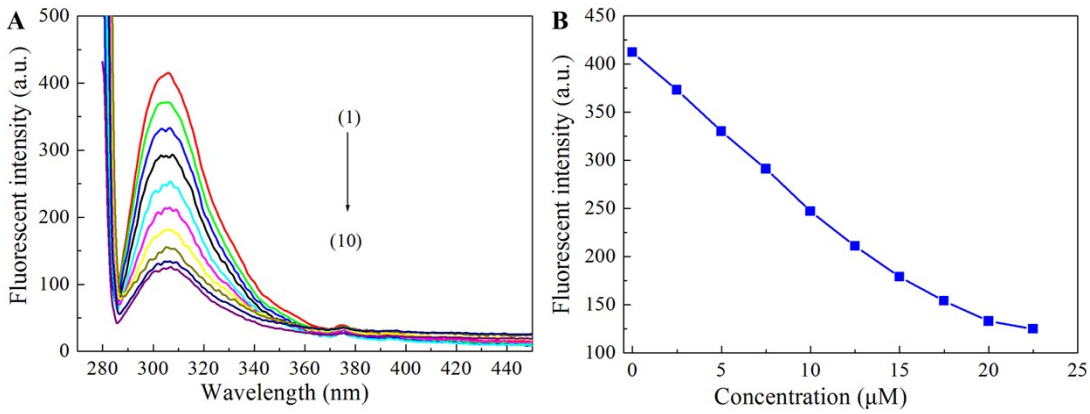

Fig. S1. (A) Fluorescence spectra of 10 μM in 0.01 M PBS (pH 7.0) containing aptamers with different concentration: (1) 0, (2) 2.5, (3) 5.0, (4) 7.5, (5) 10.0, (6)12.5, (7) 15.0, (8) 17.5, (9) 20.0, and (10) 22.5 μM. The fluorescence spectra were obtained on the Cary Eclipse (Varian, America) with λ_{ex} = 280 nm. (B) The Fluorescence intensity as a function of the concentration of the aptamer.