Fabrication of an antibody-aptamer sandwich assay for electrochemical evaluation of levels of *β*-amyloid oligomers

Yanli Zhou[1,2], Huanqing Zhang[2], Lantao Liu[1], Congming Li[2], Zhu Chang[1], Xu Zhu[1], Baoxian Ye[2] & Maotian Xu[1,2]

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

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

Correspondence and requests for materials should be addressed to L.L. (email: liult05@iccas.ac.cn) or M.X. (email: xumaotian@sqnc.edu.cn)
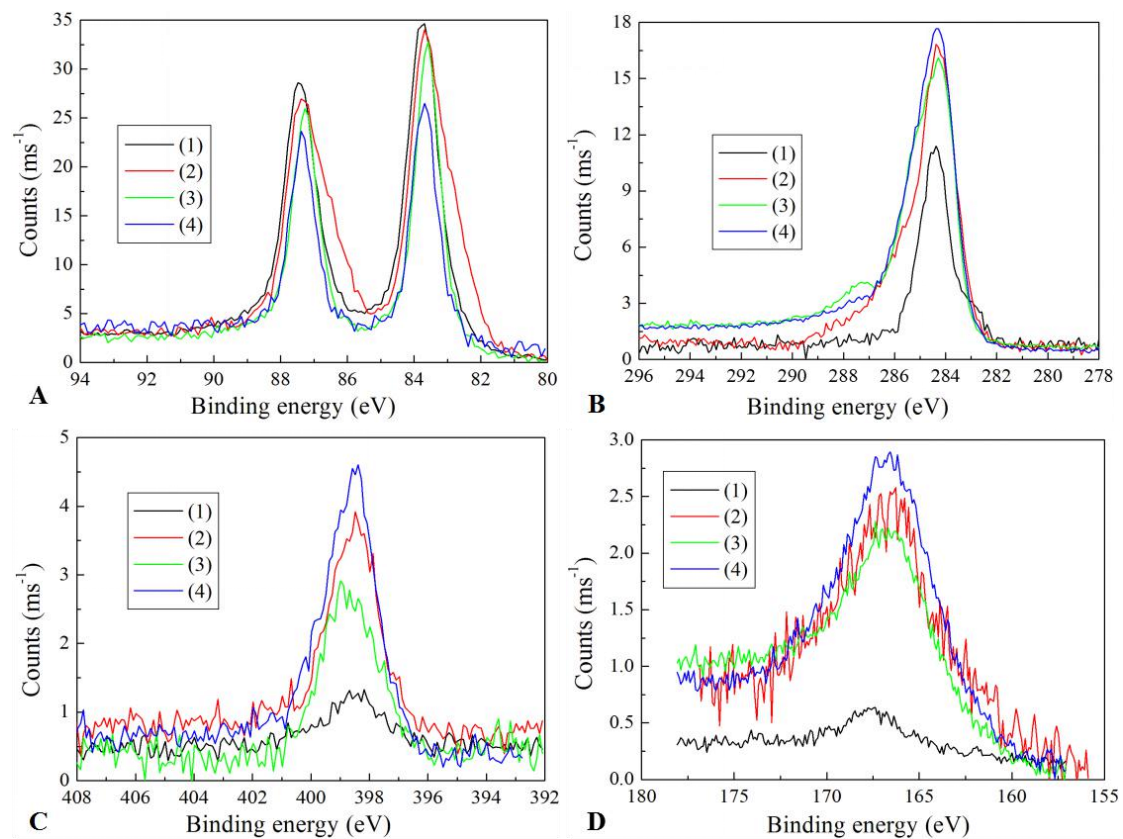
Figure S1. Au 4f (A), C 1s (B), N 1s (C), and S 2p (D) XPS spectra of AuNPs before (1) and after modification of Th (2), aptamer (3), and Th and aptamer (4).

Method	Principle	Detection limit	Advantage	Limitation	Refs.
Electrochemical biosensor	peptide recognition	0.048 nM	high sensitivity	low specificity	[7]
Electrochemical biosensor	protein recognition	0.5 pM	high sensitivity	low specificity	[8]
Electrochemical biosensor	antibody recognition	not detected	simplicity	nonspecific adsorption	[9]
Localized SPR sensor	antibody recognition	100 fM	high sensitivity and simplicity	nonspecific adsorption	[10]
SPR biosensor	antibody recognition	not detected	simplicity	nonspecific adsorption	[11]
Fluorescent sensor	interaction with probe	not detected	simplicity	low specificity	[12-16]
Fluorescent sensor	peptide recognition	0.2 nM	high sensitivity and simplicity	low specificity	[17]
Fluorescent sensor	interaction with probe	3.57 nM	high sensitivity and simplicity	low specificity	[18]
Fluorescent sensor	antibody recognition	3 pg mL^{-1}	high sensitivity and simplicity	nonspecific adsorption	[19]
Fluorescent sensor	peptide recognition	1 nM	high sensitivity and simplicity	low specificity	[20]
SERS	nanofluidic biosensor	not detected	high sensitivity and selectivity	expensive instrument, complex operation	[21]
MS	laser-induced liquid bead ion desorption	not detected	high sensitivity and selectivity	expensive instrument, complex operation	[23]
ELISA	magnetic bead immunoassay	10.7 pg mL^{-1}	high sensitivity and specificity	time-consuming operation	[29]
Electrochemical biosensor	antibody recognition	100 pM	high sensitivity and selectivity	nonspecific adsorption	This work

Table S1. Comparison of analytical characteristics for detection of Aβ oligomers using various methods.