

SUPPORTING INFORMATION

Aptameric Peptide for One-step Detection of Protein Kinase

Xiahong Xu, Jiang Zhou, Xin Liu, Zhou Nie, Meng Qing, Manli Guo, Shouzhuo Yao*

State Key Laboratory of Chemo/Biosensing and Chemometrics, College of Chemistry
and Chemical Engineering, Hunan University, Changsha, 410082, P. R. China

* Corresponding author. Tel.: +86-731-88821626; Fax: +86-731-88821848 E-mail

address: niezhou.hnu@gmail.com

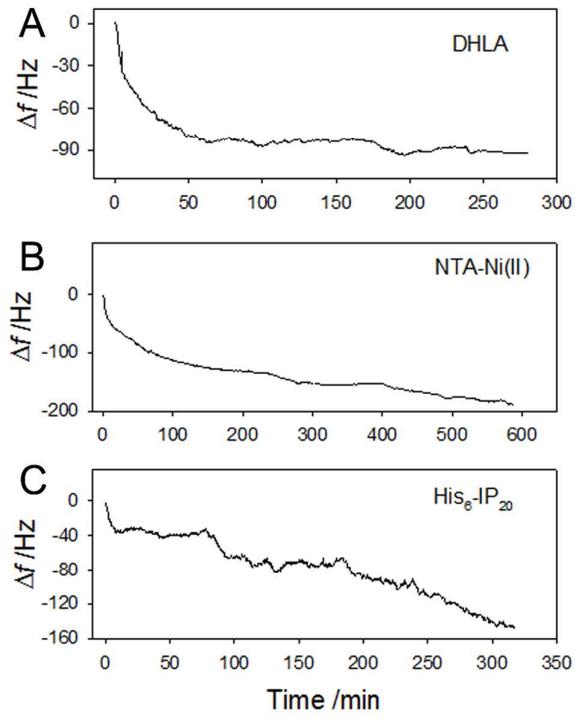


Figure S1. Real-time frequency response to DHLA (A), NTA-Ni(II) (B) and His₆-IP₂₀ (C) assembly.

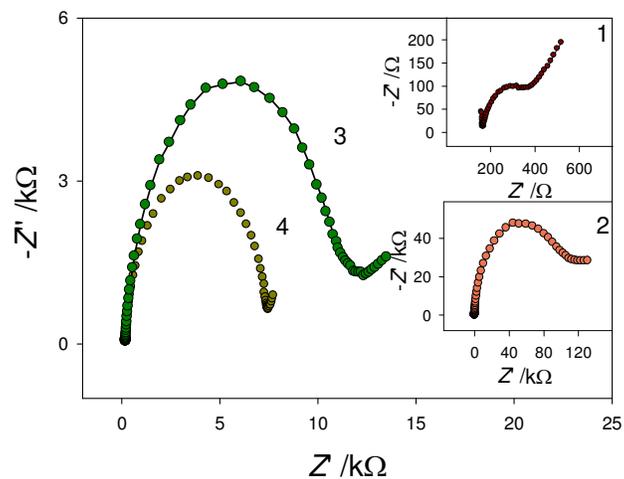


Figure S2. Electrochemical impedance (EIS) spectra in a TBS solution (pH 7.4) containing 5.0 mM $K_4Fe(CN)_6$ + 5.0 mM $K_3Fe(CN)_6$ at various QCM electrodes: Bare Au (curve 1), DHLA immobilized Au electrode (curve 2), NTA/Ni(II)-DHLA-Au electrode (curve 3), aptameric peptide (IP_{20}) immobilized Au electrode (curve 4). Scan rate: 100 mV s^{-1} . $100\text{ kHz} - 0.05\text{ Hz}$, 5 mV rms , 0.20 V vs. SCE.

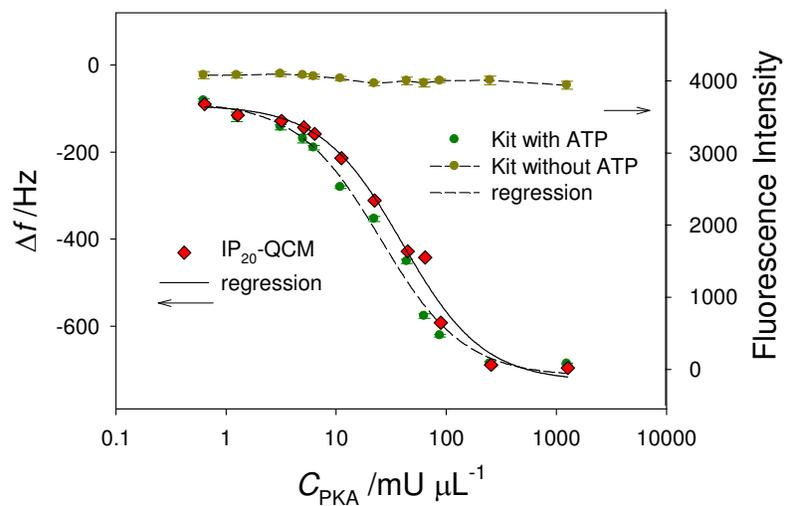


Figure S3. The comparison of the signal response of the aptameric-peptide-modified QCM electrode with the commercial kinase activity assay kit. The red quadrilaterals represent the dependence of the frequency change of the QCM sensor on the logarithmic concentration of PKA. The green and dark yellow dots represent the dependence of the frequency change of the QCM sensor on the logarithmic concentration of PKA in the presence of ATP and absence of ATP, respectively.

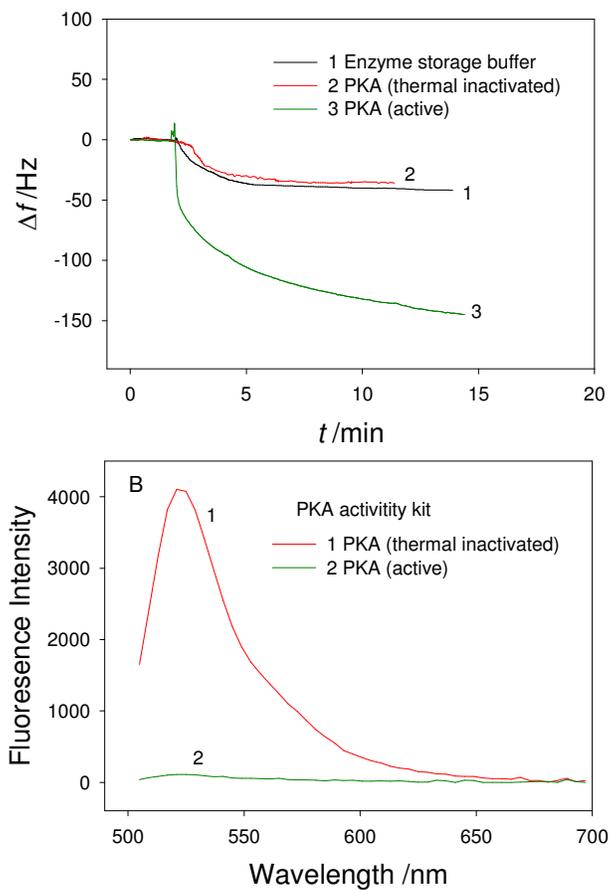


Figure S4. (A) Real-time frequency response of IP₂₀-immobilized QCM resonator to the PKA storage buffer (1), 25.52 mU μL^{-1} thermal inactivated PKA (2), or 25.52 mU μL^{-1} PKA (3). (B) Fluorescence spectra of PKA activity kit for 255.2 mU μL^{-1} PKA and thermal inactivated PKA.

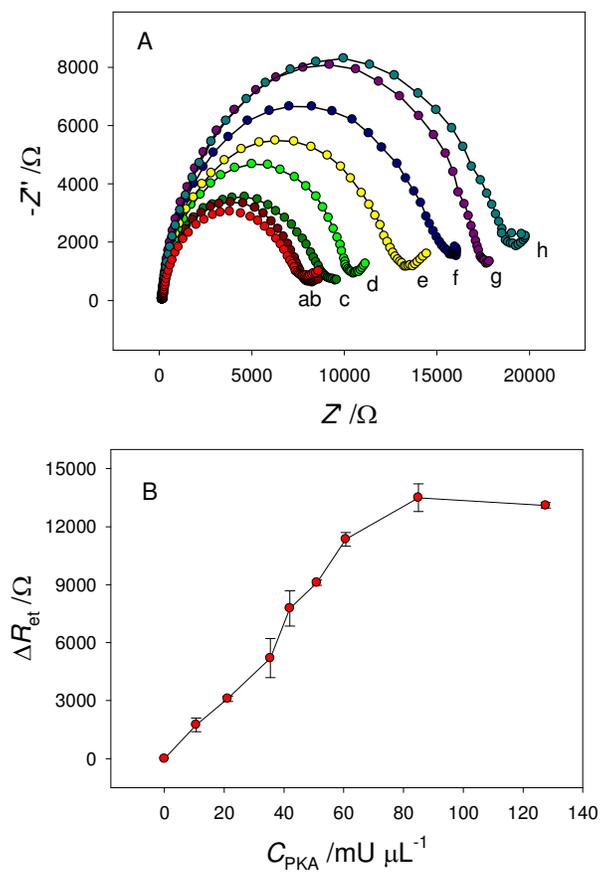


Figure S5. (A) The Nyquist plots for the Faradic impedance of IP₂₀-immobilized Au electrodes against different concentration of PKA (from a to h: 0, 10.6, 21.2, 35.4, 42, 51, 60.7, and 85 $mU \mu L^{-1}$). Electrochemical experiments were carried out in a TBS solution (pH 7.4) containing 5.0 mM $K_4Fe(CN)_6$ + 5.0 mM $K_3Fe(CN)_6$. (B) The change in the electron transfer resistance ΔR_{et} in response to the concentration of PKA.

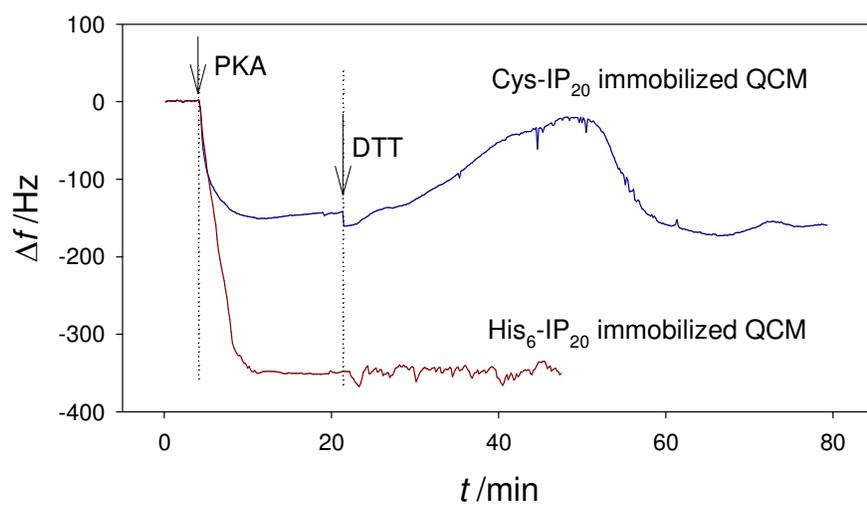


Figure S6. Frequency response of the His₆-IP₂₀ or Cys-IP₂₀ immobilized QCM to 51.04 mU μL^{-1} PKA and 10 mM DTT.

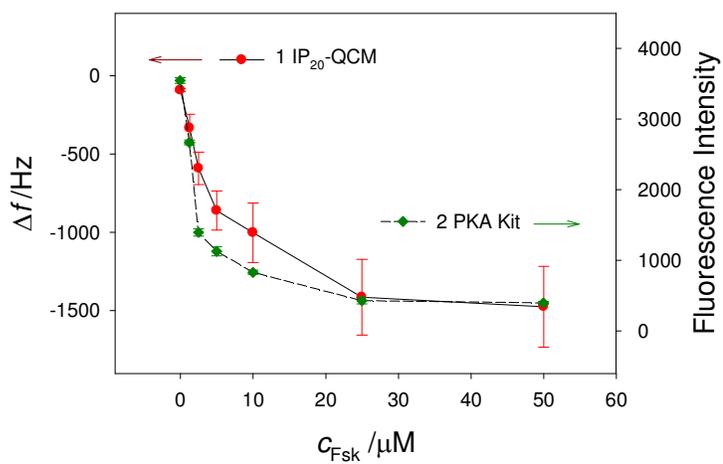


Figure S7. The frequency response of IP₂₀- immobilized QCM (1, red dots) and the fluorescent intensity of PKA activity assay kit (2, green dots) to different concentration of activator Fsk/IBMX mixture. The blank was treated with unstimulated cell lysate, and the concentration of IBMX is twice as much as Fsk.