Supporting information

G-quadruplex DNAzymes-induced highly selective and sensitive colorimetric sensing of free heme in rat brain

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Content

Figure S1. Time-dependent absorbance of ABTS at 420 nm in reaction system.

The heme microdialysis recovery in vitro.

Colorimetric sensing of rat serum heme.

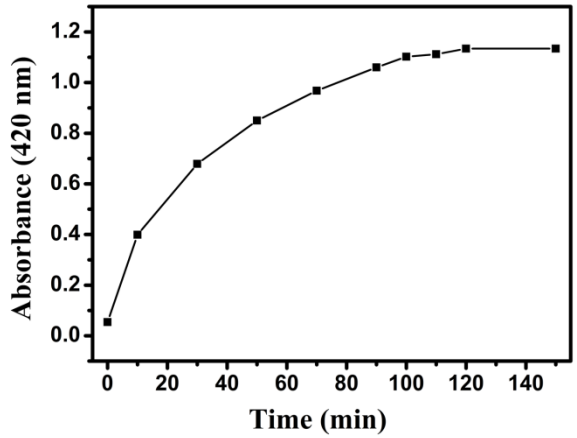

Figure S1. Time-dependent absorbance of ABTS at 420 nm in reaction system: the measurement was performed in 0.5 mL of 10 mM Tris-Ac buffer solutions (pH 7.0, 30 °C) containing 100 μM H_2O_2, 1 mM $ABTS^{2-}$, 0.25 μM PS2.M and 10 mM K^+, 100 nM heme.

The heme microdialysis recovery in vitro

The heme microdialysis recovery in vitro is 82.1±3.5%.

Firstly, the concentration of 50 nM heme in artificial cerebrospinal fluid (aCSF) were freshly prepared. Subsequently a microdialysis probe was implanted into the 50

nM heme in aCSF and then perfused with aCSF at 1.0 μL/min. Perfusing ceaselessly for at least 90 min for the sake of equilibration, the microdialysate was collected for the colorimetric sensing. 50 μL of the microdialysate sample from the 50 nM heme in aCSF was added into 430 μL of the G-quadruplex DNA solution containing K^+ (10 mM), and then incubated for about 1.0 hour. Afterwards, 10 μL of H_2O_2 (5 mM) and 10 μL of ABTS (50 mM) were added into the above mixture. For the quantitative assay of free heme in the microdialysate sample, the resulting mixture was incubated for 2.0 hours at 30 °C for UV-vis spectrometric measurements.

Colorimetric sensing of rat serum heme

The microdialysis fluid is a rather "clean" matrix, we choose rat serum samples for heme determination to demonstrate the universal applicability of our method.

Rat serum samples were provided by Peking University, which were obtained by centrifugation of blood for about 5 min with a rotation rate of 4000 rpm. Firstly, each rat serum sample (100 μL) was diluted 10 fold with 100 μL pure dimethyl sulfoxide and 800 μL Milli-Q water. And after centrifugation of above-mentioned 10-fold diluted solution for about 5 min with a rotation rate of 4000 rpm, 50 μL of supernatant was added into 430 μL of the G-quadruplex DNA solution containing K^+ (10 mM), and then incubated for about 1.0 h. Afterwards, 10 μL of H_2O_2 (5 mM) and 10 μL of ABTS (50 mM) were added into the above mixture. For the quantitative assay of heme in the rat serum samples, the resulting mixture was incubated for 2.0 h at 30 °C for UV-vis spectrometric measurements.

The initial value of the basal level of heme in rat serum samples was determined to be 993±313 nM (n=3).