Supplementary Materials for Electrochemical aptamer sensor based on AgNPs@PDANSs and "sandwich" structure guidance for the detection of tobramycin in water samples

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1. Synthesis of materials

Synthesis of PDANSs: First, 90 mg of DA was dispersed into 45 mL of water, stirred well and then 381 μL of 1 M NaOH was added and kept in a water bath at 50°C for 5 h. Subsequently, the sample was washed by centrifugation at 12,000 rmp for three times and finally the resulting precipitate was dispersed into 9 mL of ultrapure water.

Preparation of ZnONSs: Initially, a certain amount of $Zn(NO_3)_2$-$6H_2O$ was dissolved in 50 mL of water and homogeneously dispersed, and configured as an aqueous solution with a concentration of 0.1 M for use. After that, NaOH was added to 50 mL of ultrapure water to be configured as a 0.4 M aqueous NaOH solution, followed by adding the aqueous $Zn(NO_3)_2$-$6H_2O$ solution to the aqueous NaOH solution and stirring vigorously. After the dropwise addition was completed, the mixed solution was

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placed in a water bath at 60 °C and kept for 2 h. After the reaction was completed, it was removed, centrifuged and washed with water to obtain ZnONSs.

Preparation of AuNCs: First, 0.125 mL, 0.01 M $HAuCl_4$-$3H_2O$ solution was added to 3.75 mL, 0.1 M CTAB solution. Afterwards, 600 μL of 10 mM ice-cold $NaBH_4$ solution was added to the mixed solution prepared above. The two were allowed to fully react under vigorous stirring for 1 minute to form a gold seed solution. After that, the gold seed solution was allowed to stand and remain at room temperature for 1 h to ensure that it reached a stable state and to achieve the aging process. Subsequently, the nanocube growth solution was prepared by sequentially adding CTAB (0.1 M, 6.4 mL), $HAuCl_4$ (0.01 M, 0.8 mL), and AA (0.1 M, 3.8 mL) to ultrapure water (32 mL). Approximately 10 mL of the gold seed solution was diluted to 200 μL with water and added to the growth solution, which was mixed well and stored at 288°C overnight.