

## Supplementary information

### Non-invasive detection of gastric cancer relevant D-amino acids with luminescent DNA/silver nanoclusters

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### Effect of DNA sequence on the fluorescence of DNA/Ag NCs.

Ag ions (atoms) have high affinity toward cytosine bases through C-Ag-C. Varying DNA sequence tuned the optical properties of DNA/Ag NCs. The DNA sequences in our study are listed in Table S1.

Table S1 DNA sequences for synthesis of DNA/Ag NCs.

Name	DNA sequence
(PolyC) <sub>8</sub>	5'-ATCCTCCCACCGGGCCTCCCACCATAAAAACCCCTTAATCCCC-3'
(PolyC) <sub>7</sub>	5'-ATCCTGGGACCGGGCCTCCCACCATAAAAACCCCTTAATCCCC-3'
(PolyC) <sub>6</sub>	5'-ATCCTGGGACCGGGCCTAAAACCATAAAAACCCCTTAATCCCC-3'
(PolyC) <sub>5</sub>	5'-ATCCTGGGACCGGGCCTAAAACCATAAAAAGGGTTAATCCCC-3'
(PolyC) <sub>4</sub>	5'-ATCCTGGGACCGGGCCTAAAACCATAAAAAGGGTTAATAAAA-3'

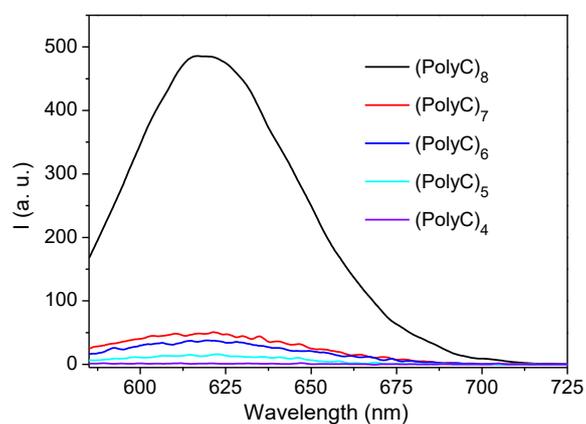


Fig. S1 Fluorescence spectra of DNA/Ag NCs with various DNA sequences.

## Assay of generation of H<sub>2</sub>O<sub>2</sub> from DAA oxidation

The D-Ala solution from 1 μM to 10 mM, and L-Ala solution at 10 mM were prepared with PBS buffer (pH 6.8, 20 mM), respectively. Then, the D/L-Ala solution were mixed with trinder reagents, incubated at 25 °C for 30 min, and the H<sub>2</sub>O<sub>2</sub> was quantified by Visible absorption spectra.

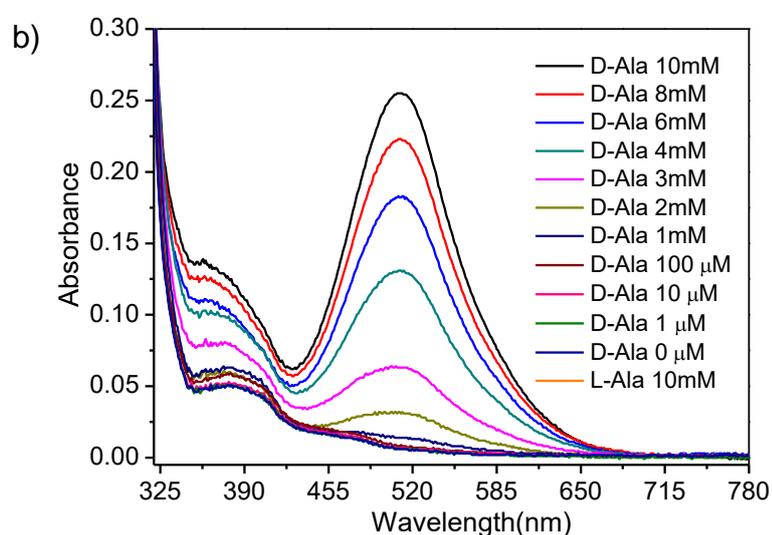
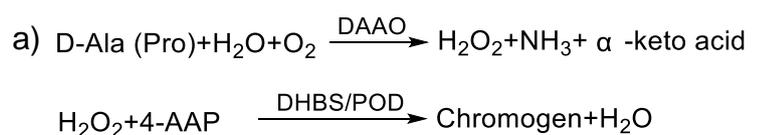


Fig. S2 Assay of generation of H<sub>2</sub>O<sub>2</sub> from DAA oxidation. Mechanism (a), spectrum (b) and photographs (c) of solution of colorimetric assay for the generation of H<sub>2</sub>O<sub>2</sub>.

### Optimization for detection of D-Pro.

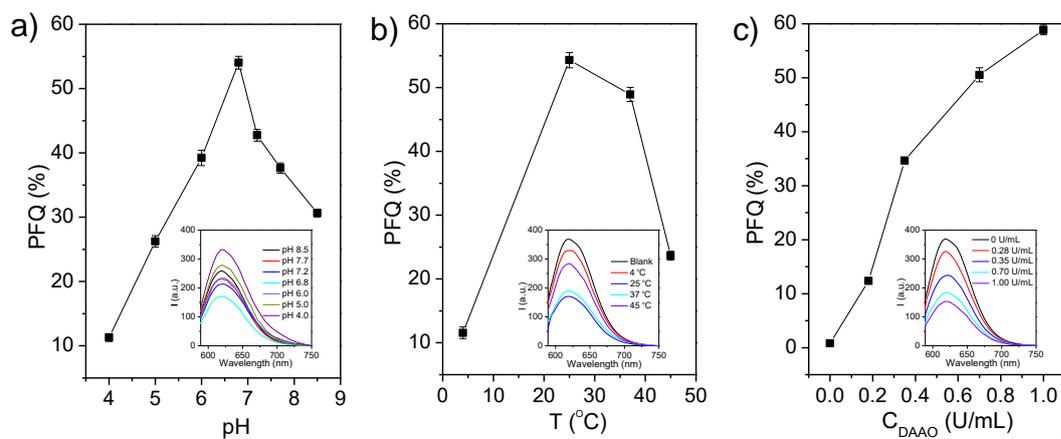


Fig. S3 (a) Effect of pH on detection. (b) Effect of temperature on detection. (c) Effect of DAAO concentration on detection. The insets in (a)-(c) are the corresponding fluorescence spectra. Error bars represent standard deviations from three measurements.

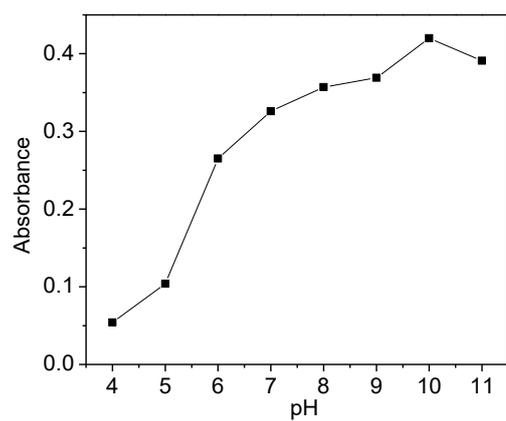


Fig. S4 Effect of pH on DAAO activity.

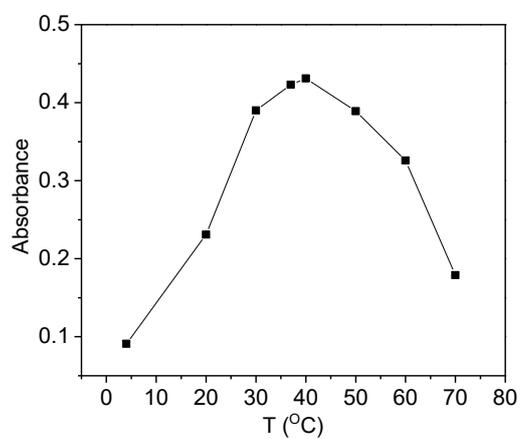


Fig. S5 Effect of temperature on DAAO activity.

### Eliminating interference of chloride ion

Chloridion ( $\text{Cl}^-$ ) are present in gastric juice and saliva, and chloridion decreased fluorescence of DNA/Ag NCs. To eliminate the influence of chloridion, we used  $\text{AgNO}_3$  to precipitate  $\text{Cl}^-$ .

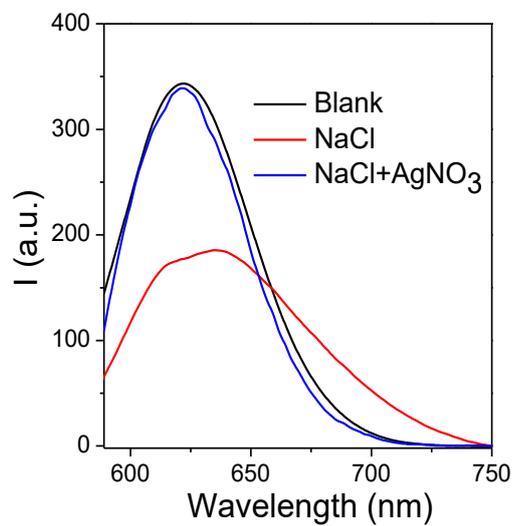


Fig. S6 Addition of  $\text{AgNO}_3$  eliminated the influence of chloridion on fluorescence of DNA/Ag NCs.