

Supplementary Information

Coupling 2-Aminopurine with DNA Copper Nanoparticles as A Rapid and Enzyme-free System for Operating DNA Contrary Logic Pairs

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Table S1 Sequences of DNA strands used in this work.

Name	Sequence (5'-3')
2AP-T20	GCATCTAATT _{A_p} TTCCTCTTCCTTTTTTTTTTTTTTTTTTTT
A20-C1	AAAAAAAAAAAAAAAAAAAAAGGAAGAGGAAAATTAGATGC
A22-C1	AAAAAAAAAAAAAAAAAAAAAGGAAGAGGAAAATTAGATGC
T30-2AP	TTTTTTTTTTTTTTTT _{A_p} TTTTTTTTTTTTTTTTT
A20	AAAAAAAAAAAAAAAAAAAAA
A25	AAAAAAAAAAAAAAAAAAAAA
A40	AAAAAAAAAAAAAAAAAAAAA
A25-C	AAAAAAAAAAAAAAAAAAAAAC
A25-G	AAAAAAAAAAAAAAAAAAAAAG
A25-T	AAAAAAAAAAAAAAAAAAAAAT

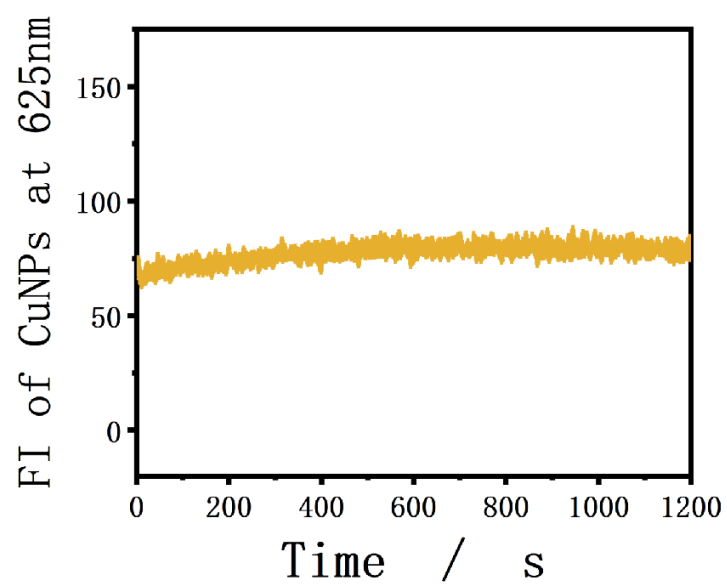


Figure S1. Fluorescence kinetics of CuNPs after adding 300 nM A20-C1 to the solution of 250 nM 2AP-T20 strand.

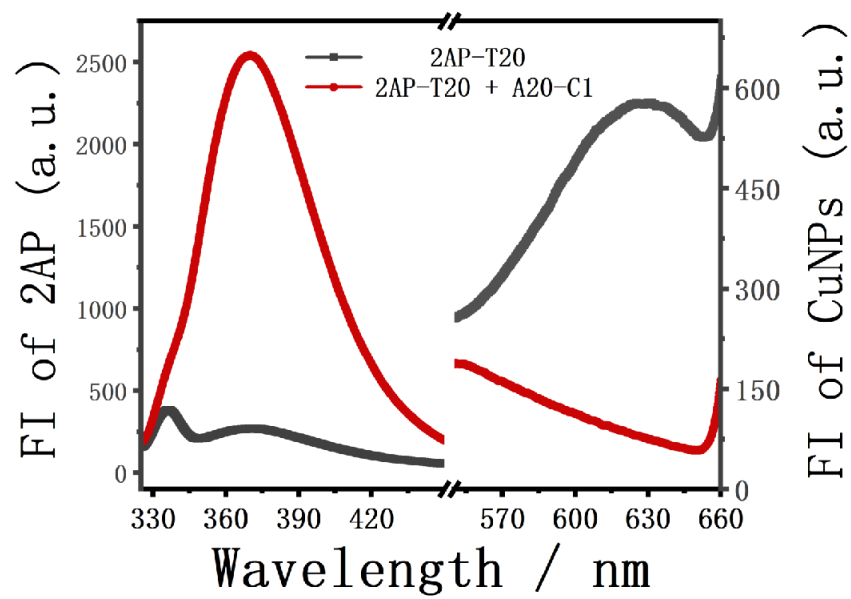


Figure S2. Fluorescence spectra of YES/NOT logic gate under different inputs.

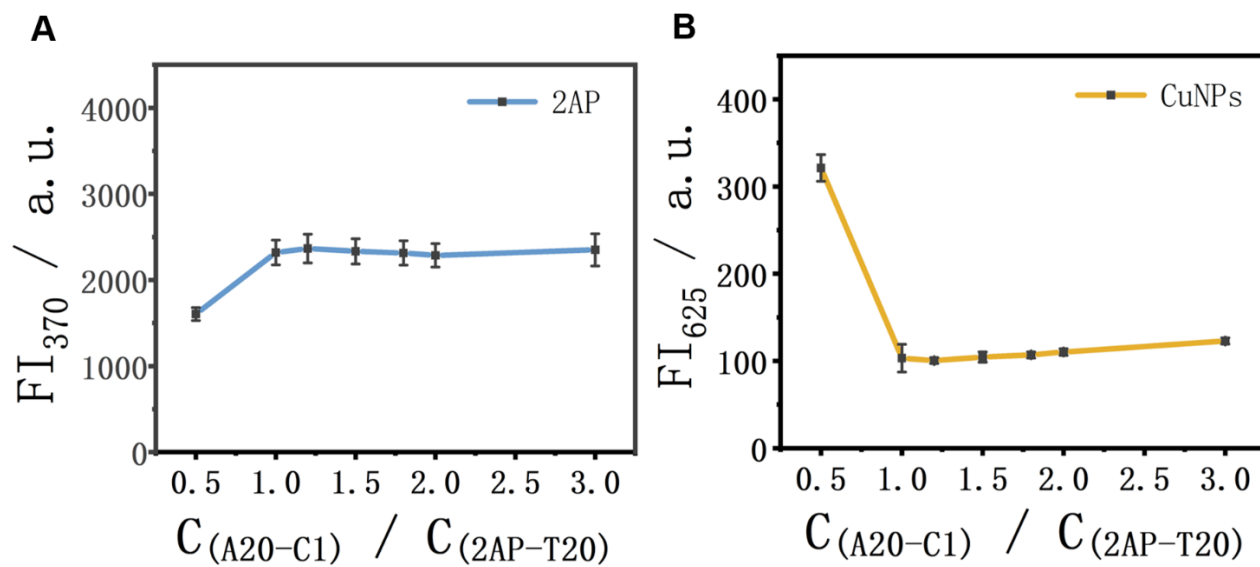


Figure S3. (A) Optimization of the concentration of A20-C1 used in D-CLPs via recording the fluorescence signal of 2AP. (B) Optimization of the concentration of A20-C1 used in D-CLPs via recording the fluorescence intensity of 2AP-T20-templated CuNPs.

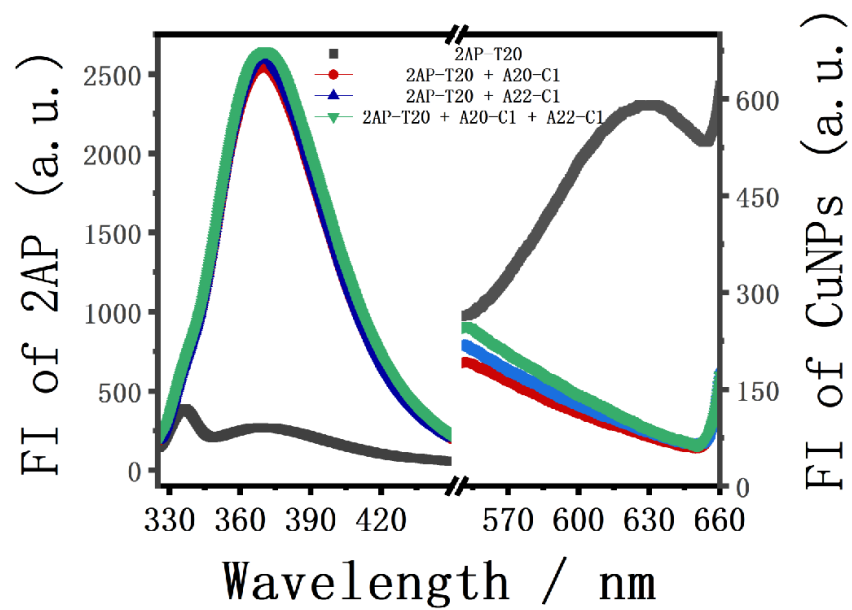


Figure S4. Fluorescence spectra of OR/NOR logic gate under different inputs.

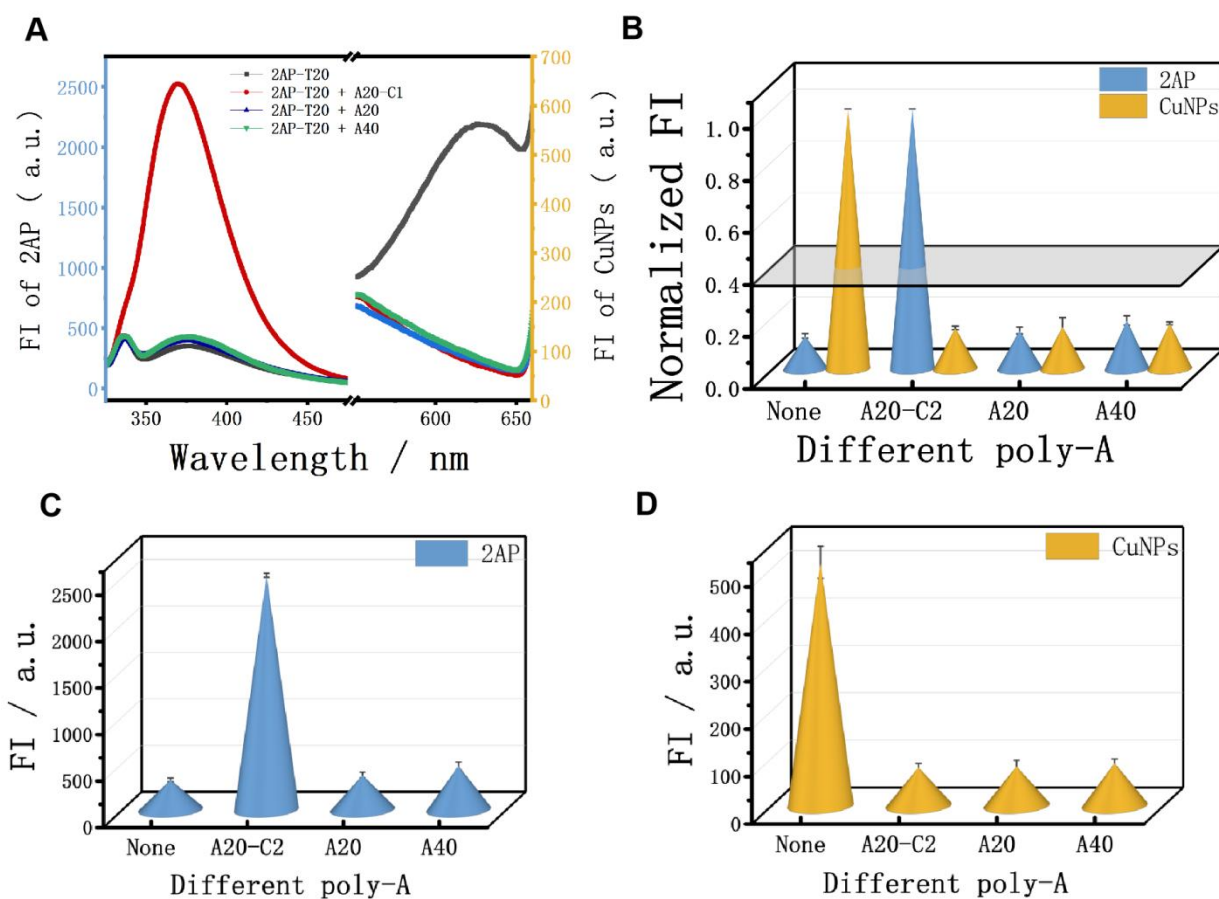


Figure S5. The different poly-A are set as control sequences to demonstrate the specific response of 2AP-T20 system. (A) Fluorescence spectra of 2AP and CuNPs with different poly-A. (B) Normalized fluorescent column bars of the 2AP (blue) and CuNPs (yellow) with different poly-A. (C) Fluorescence intensity column bars of 2AP in the presence of different poly-A. (D) Fluorescence intensity column bars of CuNPs in the presence of different poly-A.

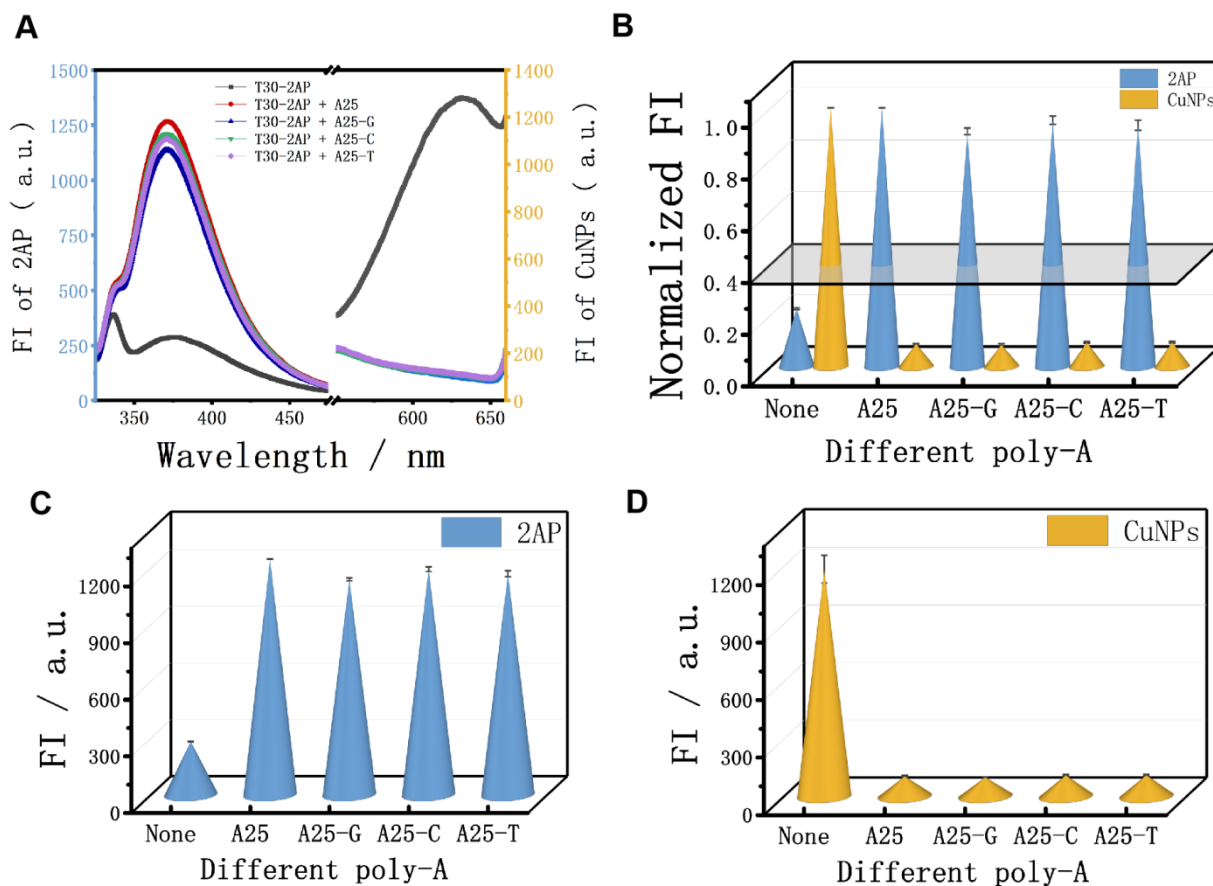


Figure S6. Different single bases are inserted into the poly-A tail to clarify the T30-2AP system's specificity. (A) Fluorescence spectra of 2AP and CuNPs with different poly-A. (B) Normalized fluorescent column bars of the 2AP (blue) and CuNPs (yellow) with different poly-A. (C) Fluorescence intensity column bars of 2AP in the presence of different poly-A. (D) Fluorescence intensity column bars of CuNPs in the presence of different poly-A.