Integration of DNA and Graphene Oxide for the Construction of Various Advanced Logic Circuits

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Table S1 Sequences of the oligonucleotides used in this work.

Name	DNA Sequence (from 5' terminal to 3' terminal)
F-DNA$_{FA}$	AAACC AACCCAAA
F-DNA$_{FS}$	ATCTA TATCA ACTTA TG
F-DNA$_{MG}$	TTCTT TTCTATCGTA AGTAACAT
IN1	ATACTAACTACATACT GGGTTGGGTAGATAGATATACTACAA
IN2	TTGTAGTATATGTATATGAGGGTTGGG AGTAT GTAGT TAGAT AGATA
IN3	TATCT ATCTA GGGTTGGG TCATA TACAT GTAGT TAGTAT
INA	ACCCAAACCCAAACCCAAACCCATAAGTTGATATCAATATAG AT
INB	ATCTATAACTTGATATAGAT TTTT TTTTT TTTTT TCAACTAT GGGTTTGGGTTTGGGTTTGGG
INC	ATCTATATATAGTTGATATC ATCTCAACTT AAAA AAAAA AAAAAT ATATC GGGTTTGGGTTTGGGTTTGGG
INA'	CTACC TTCTA TACGAT
INB'	ATCTA TACTT AGAA
INC'	ATGTTAGATGGTAG

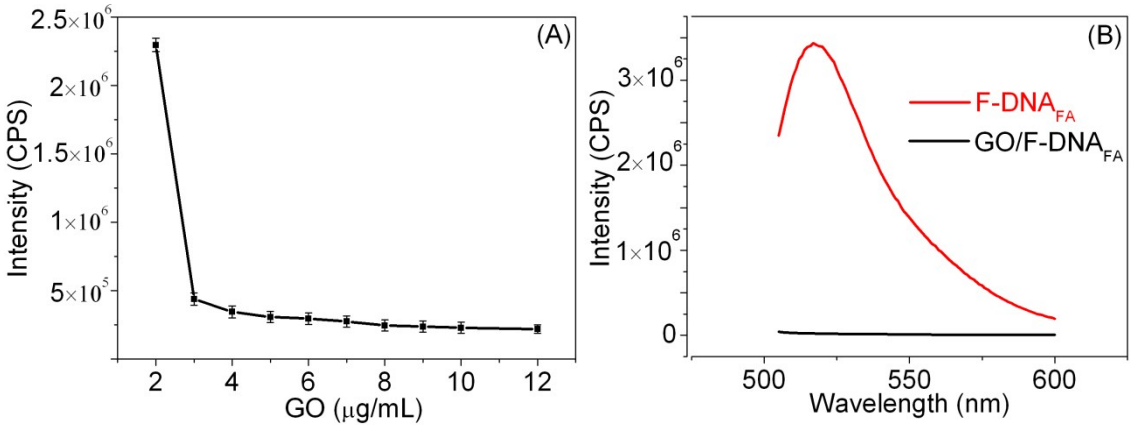

Fig. S1. (A) The FAM fluorescence response of F-DNA_{FA} in the presence of different concentration of GO. (B) Comparison of FAM fluorescence signal of F1-DNA (100 nM) before and after addition of GO (6μg/mL).

When F-DNA_{FA} binding on the GO, the fluorescence intensity of FAM is significantly quenched via noncovalent π-π stacking interaction.

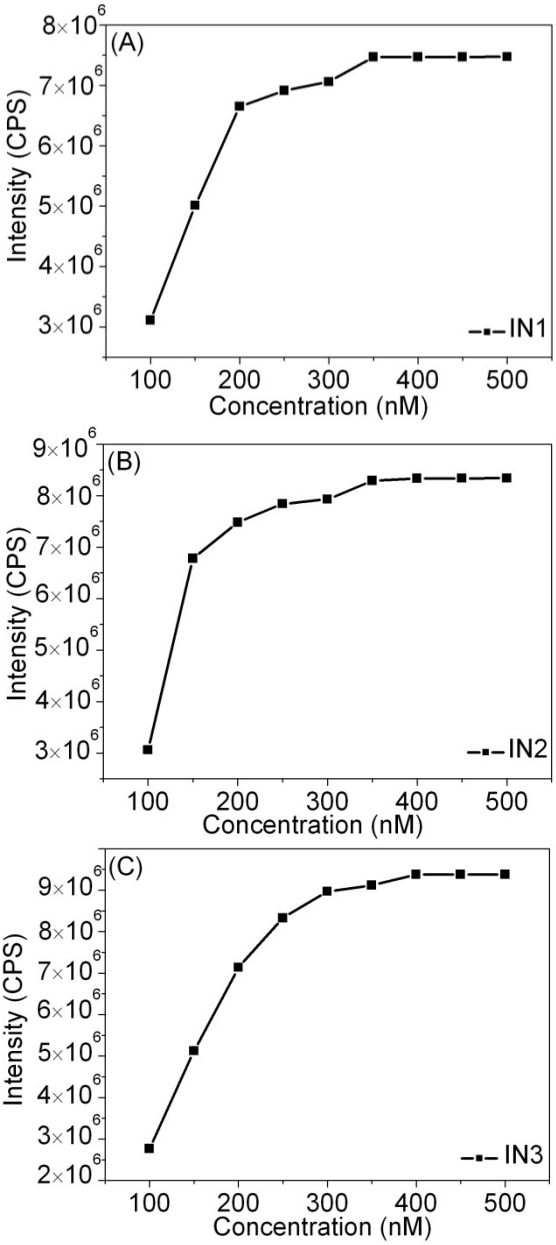

Fig. S2. The FAM fluorescence response of GO/F-DNA_{FA} at 519 nm with increasing the concentration of IN1 (A), IN2 (B) and IN3 (C).

The fluorescence of FAM is generally recovered and reaches a plateau with increasing the concentration of IN1 (A), IN2 (B) and IN3 (C). Here, 350 nM was used for each input.

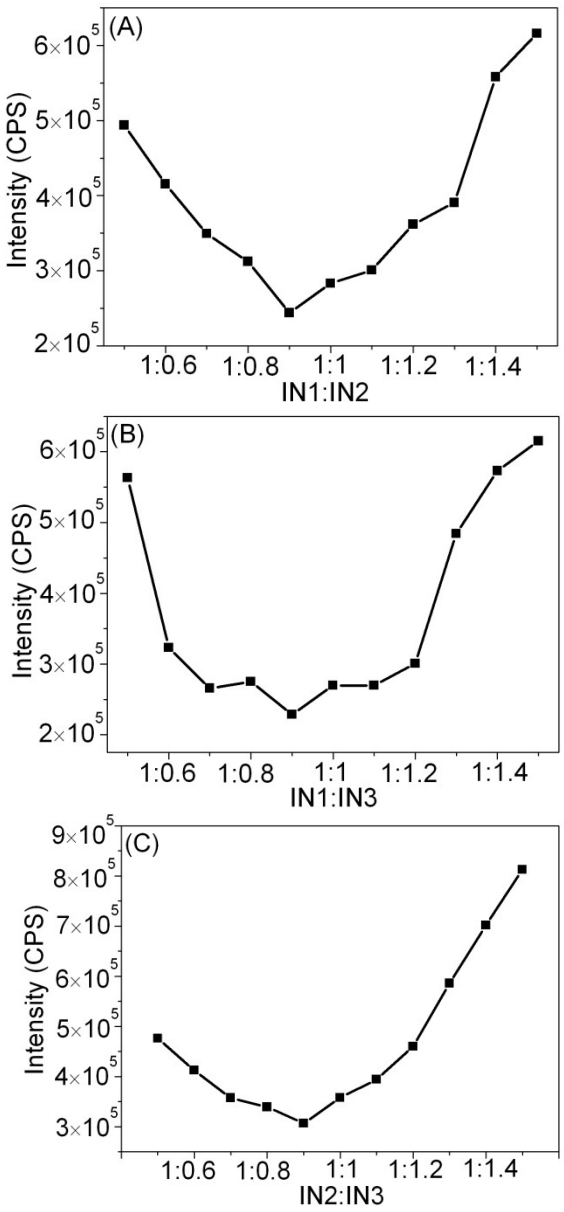

Fig. S3. The FAM fluorescence response of F-DNA$_{FA}$ with different concentration ratios of IN1:IN2 (A), IN1:IN3 (B) and IN2:IN3 (C).

The fluorescence of FAM is generally decreased when the concentration ratio is close to a proper value. That is because each of the two inputs can hybridize and leave the F-DNA$_{FA}$ on the GO with the state of quenched.

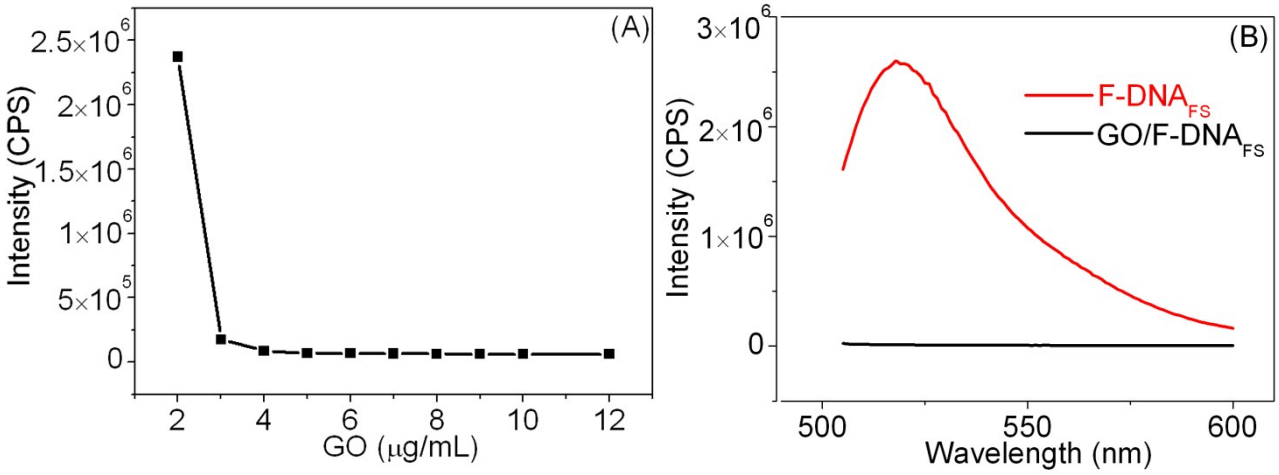

Fig. S4. (A) The FAM fluorescence response of F-DNA$_{FS}$ in the presence of different concentrations of GO. (B) Comparison of FAM fluorescence signal of F-DNA$_{FS}$ (100 nM) before and after the addition of GO (6 μg/mL).

When F-DNA$_{FS}$ binding on the GO, the fluorescence intensity of FAM is significantly quenched via noncovalent π-π stacking interaction.

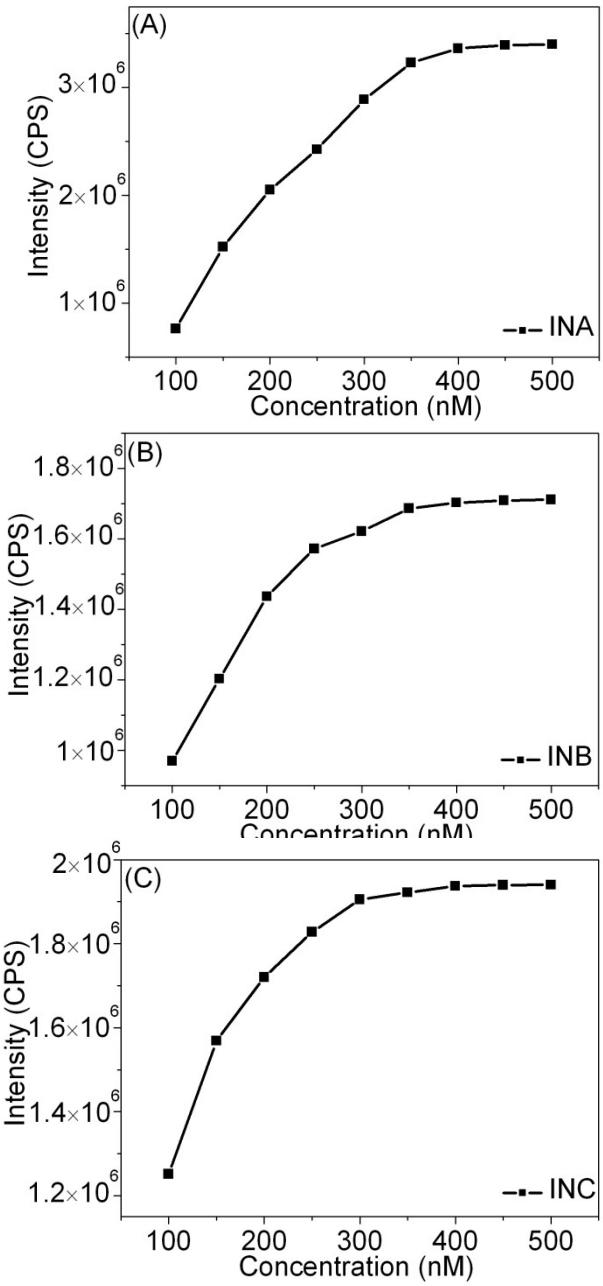

Fig. S5. The FAM fluorescence response of GO/ F-DNA$_{FS}$ at 519 nm with increasing the concentration of INA (A), INB (B) and INC (C).

The fluorescence of FAM is generally recovered and reaches a plateau with increasing the concentration of INA (A), INB (B) and INC (C). Here, 350 nM was used for each input.

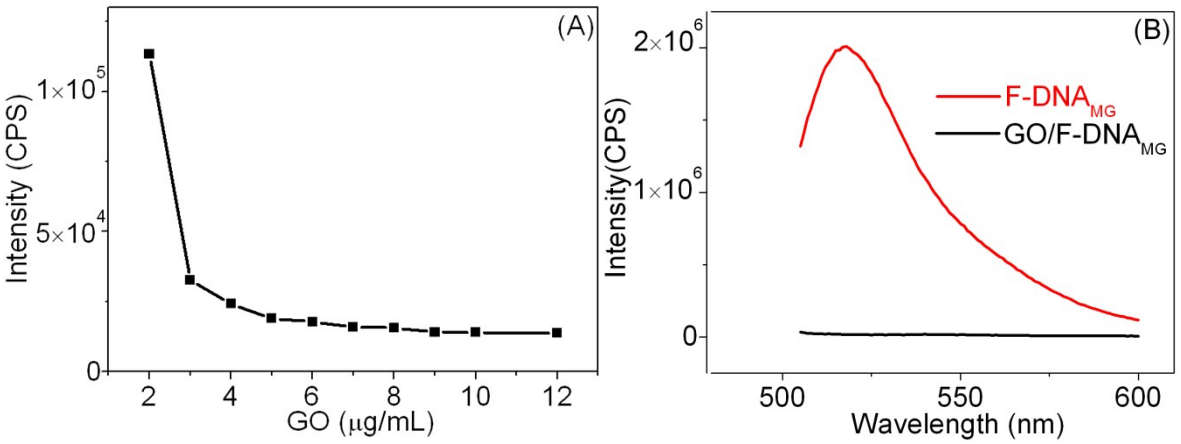

Fig. S6. (A) The FAM fluorescence response of F-DNA$_{MG}$ in the presence of different concentrations of GO. (B) Comparison of FAM fluorescence signal of F-DNA$_{MG}$ (100 nM) before and after the addition of GO (6 μg/mL).

When F-DNA$_{MG}$ binding on the GO, the fluorescence intensity of FAM is significantly quenched via noncovalent π-π stacking interaction.

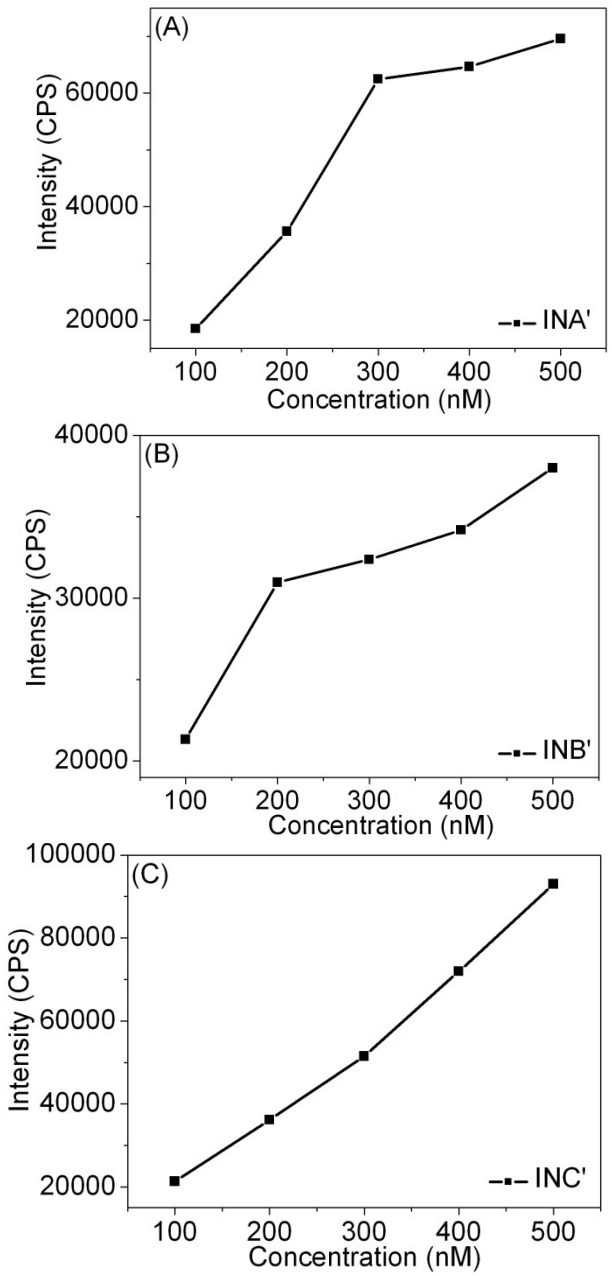

Fig. S7. The FAM fluorescence response of GO/F-DNA_{MG} at 519 nm with increasing the concentration of INA' (A), INB' (B) and INC' (C).

The fluorescence of FAM is generally recovered and reaches a plateau with increasing the concentration of INA' (A), INB' (B) and INC' (C). Here, 350 nM was used for each input.