Electronic Supplementary Information (ESI)

Ultrasensitive chemiluminescent immunoassay labeled with graphene oxide

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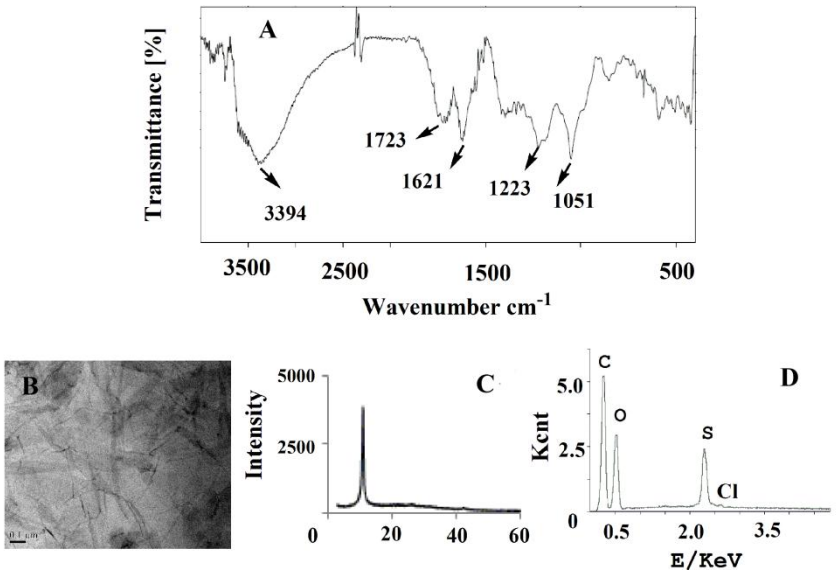

Figure S1. (A) FT-IR spectrum of GO. (B) TEM image of GO. (C) XRD pattern of GO. (D) EDX analysis spectrum of GO.

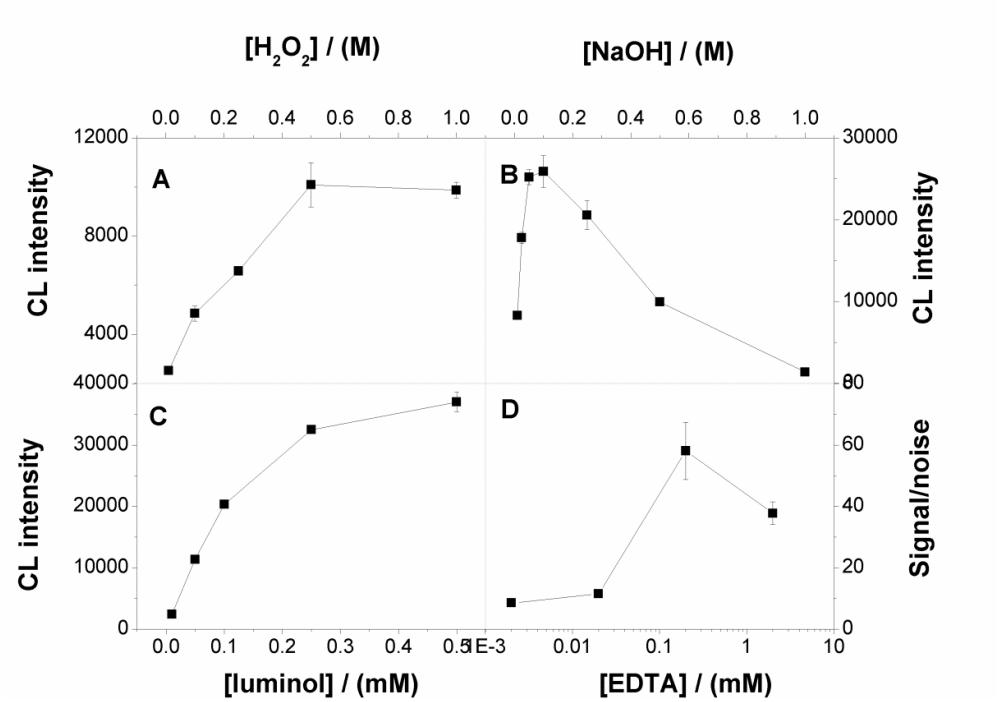

Figure S2. Effects of the reactant conditions on the luminol-H_2O_2-GO CL system. (A) Effect of H_2O_2 concentration, experimental conditions: luminol (diluted in 0.01 M NaOH), 0.2 mM; EDTA, 0.2 mM; GO, 20 μg/mL. (B) Effect of NaOH concentration, experimental conditions: H_2O_2, 0.5 M; other experimental conditions were the same as (A). (C) Effect of luminol concentration, experimental conditions: H_2O_2, 0.5 M; luminol (diluted in 0.1 M NaOH); other experimental conditions were the same as (A). (D) Effect of EDTA concentration, experimental conditions: H_2O_2, 0.5 M; luminol (diluted in 0.1 M NaOH), 0.1 mM; GO, 20 μg/mL.

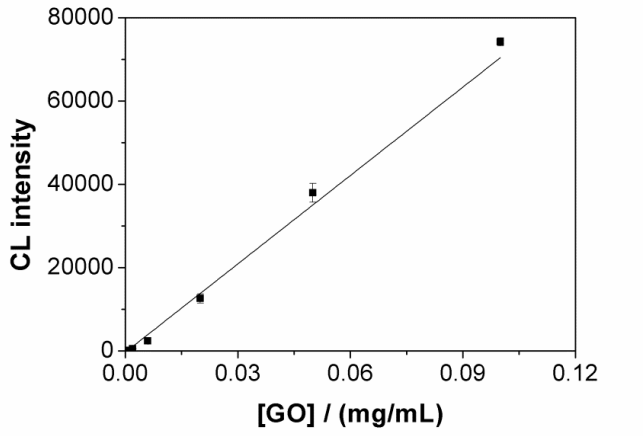

Figure S3. CL intensity vs. different concentrations of GO. Experimental conditions: H_2O_2, 0.5 M; luminol (diluted in 0.1 M NaOH) 0.1 mM; EDTA, 0.2 mM.

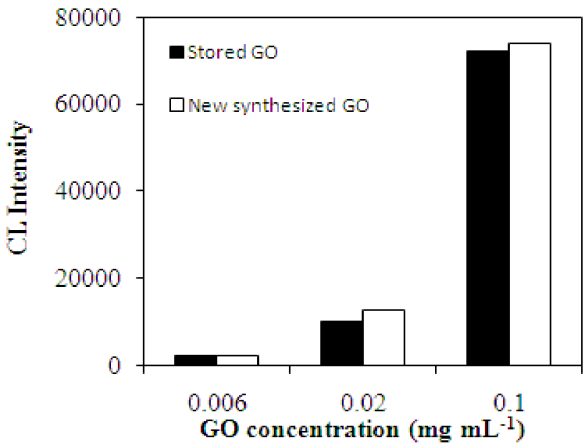

Figure S4. Comparison of catalytic property between new synthesized GO and stored GO. Experimental conditions: H_2O_2, 0.5 M; luminol (diluted in 0.1 M NaOH), 0.1 mM; EDTA, 0.2 mM.

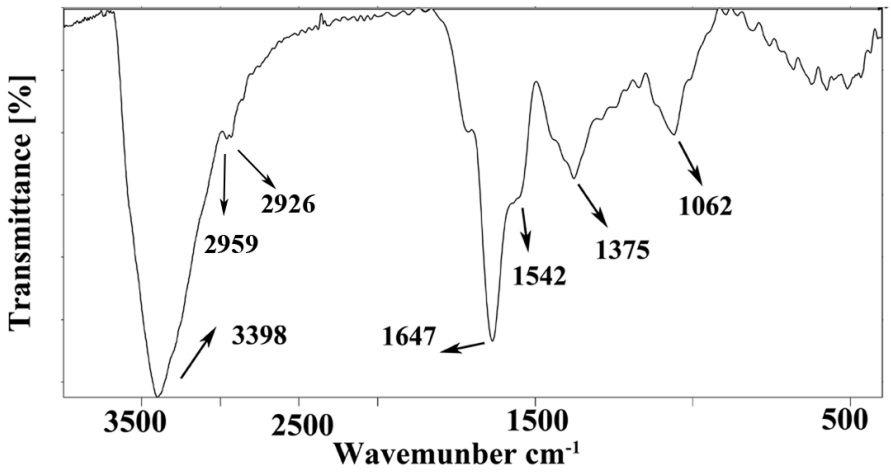

Figure S5. FT-IR spectrum of Ab_2-GO

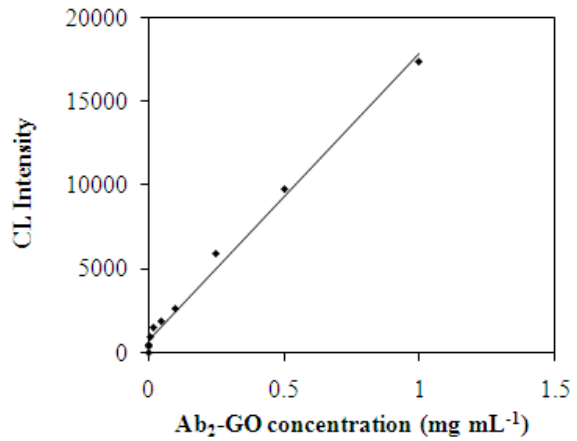

Figure S6. CL intensity vs. different concentrations of Ab_2-GO. Experimental conditions: H_2O_2, 0.5 M; luminol (diluted in 0.1 M NaOH) 0.1 mM; EDTA, 0.2 mM.

Table S1. Comparison of Immunoassay Methods developed for IgG

Analytical method	Label	Detection limit	Ref
Electrochemical assay	label-free	3 ng/mL	S1
Electrochemical assay	HRP	25 ng/mL	S2
Amperometry	HRP	1.2 ng/mL	S3
Potentiometric flow injection analysis	Urease	1200 ng/mL	S4
Voltammetry at intedigitatated array electrode	AP	10 ng/mL	S5
Time-resolved fluorescence assay	AP	0.03 ng/mL	S6
Fluorescence assay	HRP	2 ng/mL	S7
Flow injection chemiluminescence detection	Au	0.52 ng/mL	S8
Chemiluminescence detection	GO	1.2 pg/mL	This work
Surface plasmon resonance	Au	30 ng/mL	S9
Atomic absorption spectral assay	Au	8 ng/mL	S10

Table S2. Results of the determination of human IgG in diluted serum using GO based CLIA (n=3)

Human IgG Added (pg)	Human IgG Found (pg)	Recovery (%)	R. S. D.(%)
1	0.98	98.4	2.1
10	9.14	91.4	16.8
100	113.90	113.9	14.8

References

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