

Enhanced photoelectrochemical cytosensing of fibroblast-like synoviocyte cell based on visible light-activated ox-GQDs and carboxylated g-C₃N₄ sensitized TiO₂ nanorods

Xuehui Pang¹, Yong Zhang¹, Cheng Liu¹, Ya Huang¹, Yaoguang Wang¹, Jihong Pan², Qin Wei^{1*}, Bin Du¹

¹Key Laboratory of Chemical Sensing & Analysis in Universities of Shandong, Key Laboratory of Fluorine Chemistry and Chemical Materials of Shandong Province, University of Jinan, Jinan 250022, China

²Shandong Medicinal Biotechnology Centre, the Key Lab for Biotechnology Drugs of Ministry of Health, the Key Lab of Rare and Uncommon Disease, Jinan 250022, China

*Corresponding author. Tel.: +86 531 8276 7872. Fax: +86 531 8276 7367.

E-mail address: sdjndxwq@163.com

S1. Results for the detection of FLS samples

Table S1 Results for the detection of FLS samples

Sample	Addition content	Detection content	RSD	Recovery
(cell/ μ L)	(cell/ μ L)	(cell/ μ L)	(%, n= 5)	(%)
110	200	309, 315, 299, 302, 308	2.04	98.3
205	500	725, 695, 715, 712, 693	1.93	101

S2. Nyquist plots of the modification process

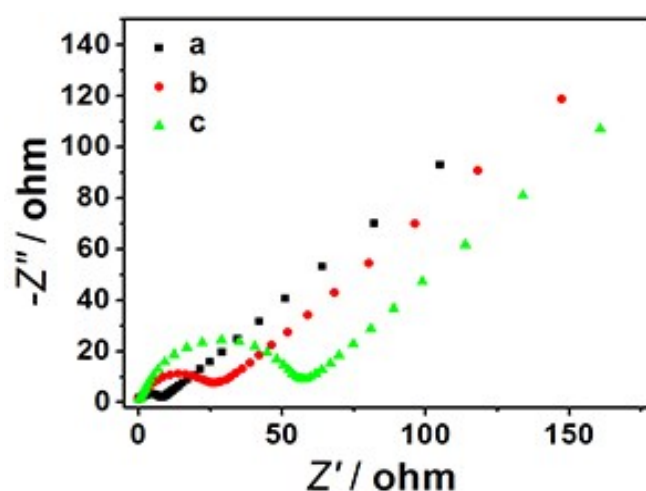


Figure S1 Nyquist plots of the modified electrode (a) before and (b) after being modified ox-GQDs/carboxylated g- C_3N_4 /TiO₂ NRs, (c) after being modified CD95/ox-GQDs/carboxylated g- C_3N_4 /TiO₂ NRs.

All the tests were carried out in 0.1 mol/L KCl aqueous solution containing 5.0 mmol/L $K_3Fe(CN)_6/K_4Fe(CN)_6$ (1:1). The frequency range was from 50 mHz to 100 kHz with 5 mV amplitude. Form the above figure, it can be seen that the charge transfer resistance (R_{et}) of naked ITO was very low. After being modified the nanohybridization of TiO₂ NRs/carboxylated g- C_3N_4 /ox-GQDs, R_{et} increased nearly to 26 Ω . And after

CD95 antibody was dropped on the electrode, R_{et} increased nearly two times to 56Ω , which suggested that the antibody was insulative.

S3. Comparisons of this work with other works

Table S2 Comparison of PEC in cell detection

Ref.	Strategy	Detection limit (cell/mL)	Linear range (cell/mL)	Detection target
this work	Base on TiO_2 /carboxylated g- C_3N_4 /ox-GQDs	2000	$1.0 \times 10^4 \sim 1.0 \times 10^7$	FLS cell
1	Based on photoactive films by PDDA and CdSe nanoparticles capped with mercaptoacetic acid	84	160~1600	Ramos cell
2	Based on CdS-polyamidoamine nano-composite film	5.0×10^3	$5.0 \times 10^3 \sim 1.0 \times 10^7$	SMMC-7721 cell
3	Based on Ag_2S QDs	98	300~2000	MCF-7 cell
4	Based on Mn-doped CdS QDs	200	$3.5 \times 10^2 \sim 7.0 \times 10^6$	K562 leukemia cells
5	Based on Graphene–CdS nanocomposites	100	$1.0 \times 10^2 \sim 5.0 \times 10^6$	Hela cell

Table S3 Comparison of different methods in cell detection

Ref.	Method	Detection limit (cell/mL)	Linear range (cell/mL)	Detection target
this work	PEC	2000	$1.0 \times 10^4 \sim 1.0 \times 10^7$	FLS cell
6	DPV	620	$1.0 \times 10^3 \sim 10^7$	BGCcell
7	DPV	500	$8.0 \times 10^2 \sim 2.0 \times 10^7$	Hela cell
8	EIS	5000	$1.0 \times 10^4 \sim 10^7$	HL-60 cell
9	Quartz crystal microbalance	750	$7.5 \times 10^2 \sim 7.5 \times 10^7$	Escherichia coli.
10	EIS and CV	6000	$6 \times 10^4 \sim 6 \times 10^7$	Escherichia coli.
11	EIS	10^5	$10^5 \sim 10^9$	Salmonella typhimurium
12	EIS	1000	$5 \times 10^3 \sim 5.0 \times 10^7$	K562 cell
13	EIS	500	$5.0 \times 10^4 \sim 10^7$	K562 cell
14	EIS	6000	$1.0 \times 10^4 \sim 10^7$	CCRF-CEM cell

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