

Electronic Supplementary Material (ESI)

Multiwalled carbon nanotubes@reduced graphene oxide nanoribbons heterostructure: synthesis, intrinsic peroxidase-like catalytic activity, and its application in colorimetric biosensing†

Jing Qian,^a Xingwang Yang,^a Zhenting Yang,^a Gangbing Zhu,^b Hanping Mao^a and

Kun Wang ^{a*}

^aKey Laboratory of Modern Agriculture Equipment and Technology, School of Chemistry and Chemical Engineering, Jiangsu University, Zhenjiang 212013, P. R. China

^bSchool of the Environment and Safety Engineering, Jiangsu University, Zhenjiang 212013, PR China

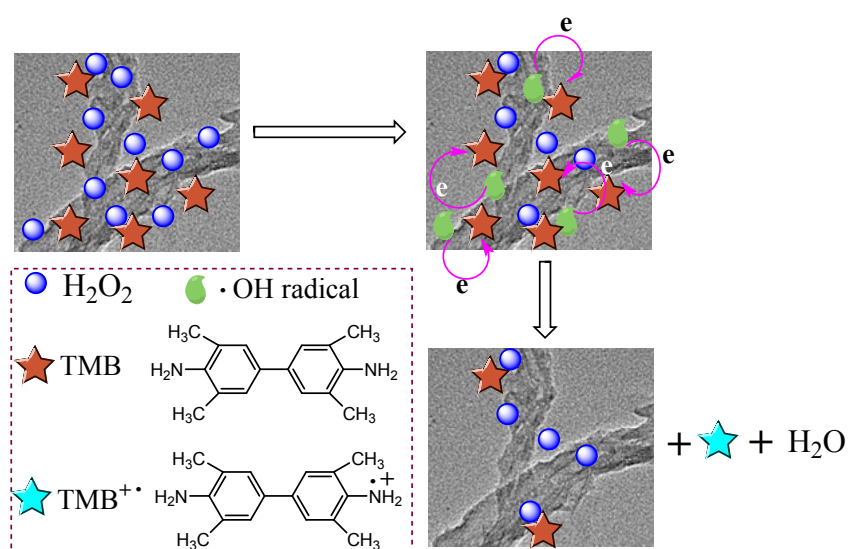
Corresponding author: Tel.: +86 511 88791800; Fax: +86 511 88791708;

E-mail: wangkun@ujs.edu.cn (K. Wang).

Table S1 Results of the determination of the free cholesterol in real serum samples.

Content/ mM ^a	Added/ mM	Found/ mM	Recovery/ %
1.24	1	2.21	97.0
1.47	2	3.56	104.5
1.83	3	4.72	96.3

^a The contents of the free cholesterol in the original serum samples obtained by the local hospital.



Scheme S1. Possible catalytic mechanism for the MWCNT@rGONR+H₂O₂+TMB system.

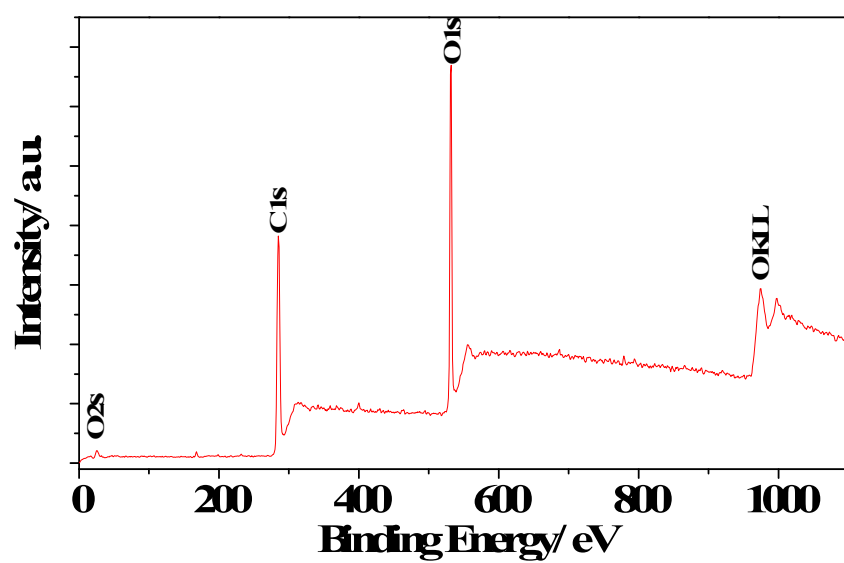


Fig. S1 The typical survey XPS of MWCNT@rGONR heterostructures.

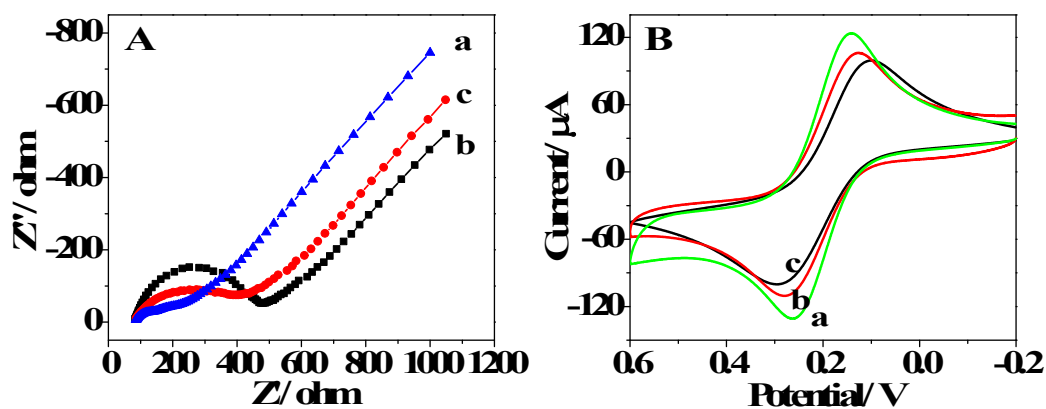


Fig. S2 EIS (A) and CV (B) response corresponding to different electrodes in 0.1 M KCl aqueous solution containing 5.0 mM $[\text{Fe}(\text{CN})_6]^{3-/4-}$ (1:1, mole:mole). From a to c: bare GCE, MWCNT@GONR/GCE, and MWCNT@rGONR/GCE.

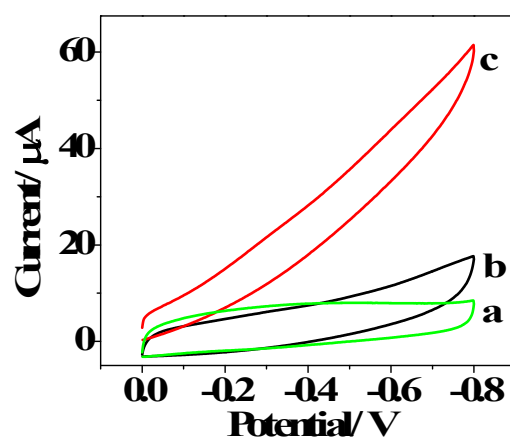


Fig. S3 CVs of the bare GCE (a), MWCNT@GONR/GCE (b), and MWCNT@rGONR/GCE (c) in 50 mM PBS (pH 5.0) at a scan rate of 100 mV s⁻¹ in the presence of 50 mM H₂O₂.

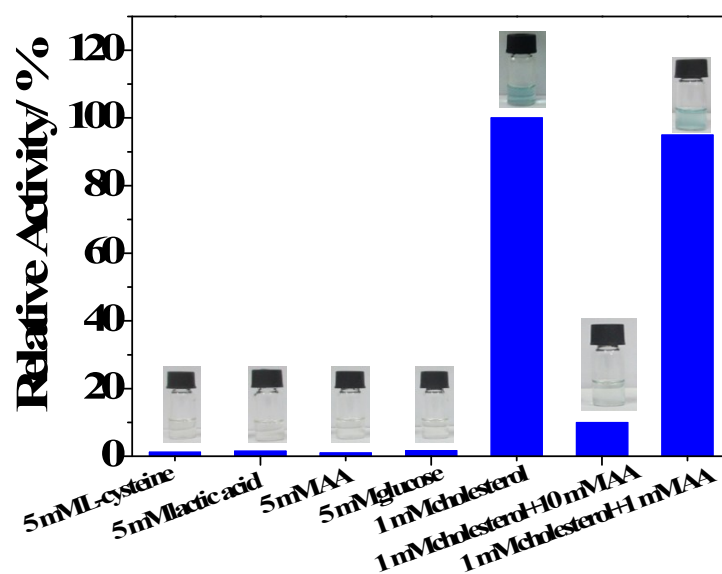


Fig. S4 Selectivity analysis for cholesterol detection: the relative activity in the presence of 5 mM L-cysteine, 5 mM lactic acid, 5 mM AA, 5 mM glucose, 1 mM cholesterol, 1 mM cholesterol + 10 mM AA, and 1 mM cholesterol + 1 mM AA.