

Electronic Supplementary Information (ESI)

Amperometric Cholesterol Biosensor Based on Enzyme Immobilized Microtubular ZnO@ZnS Heterostructure with Excellent Sensitivity and LOD

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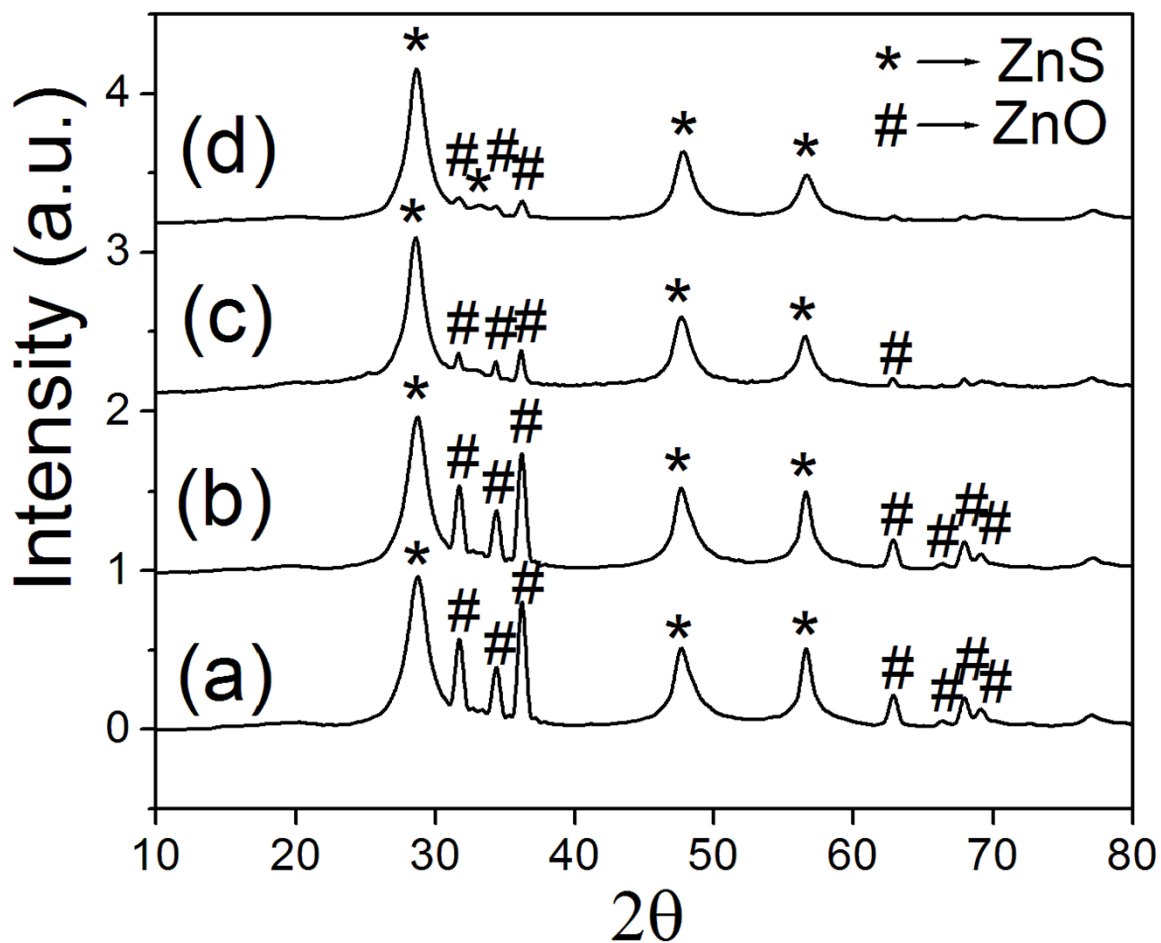


Fig. S1 XRD pattern of the synthesized microtubular ZnO@ZnS heterostructure with varying amount of ZnS, obtained reacting the ZnO and Na₂S for (a) 30 min., (b) 1h, (c) 2h and (d) 3h.

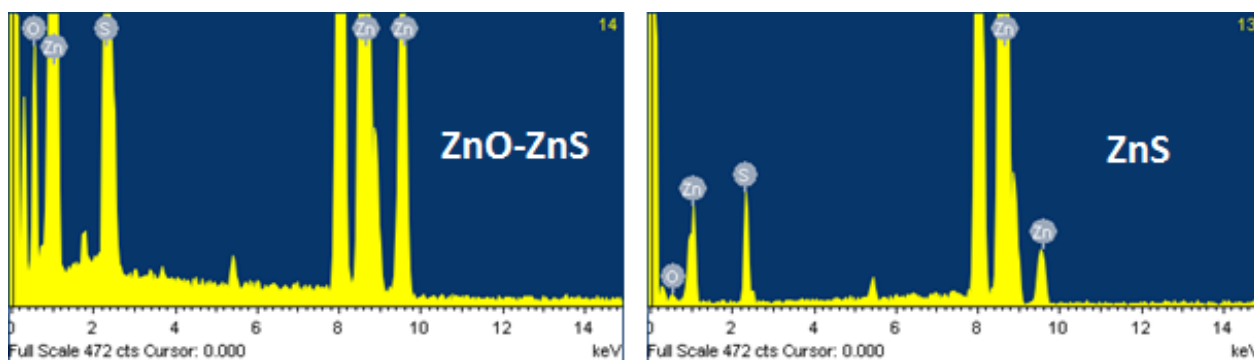


Fig. S2 EDX spectra of the synthesized microtubular ZnO@ZnS heterostructure and ZnS.

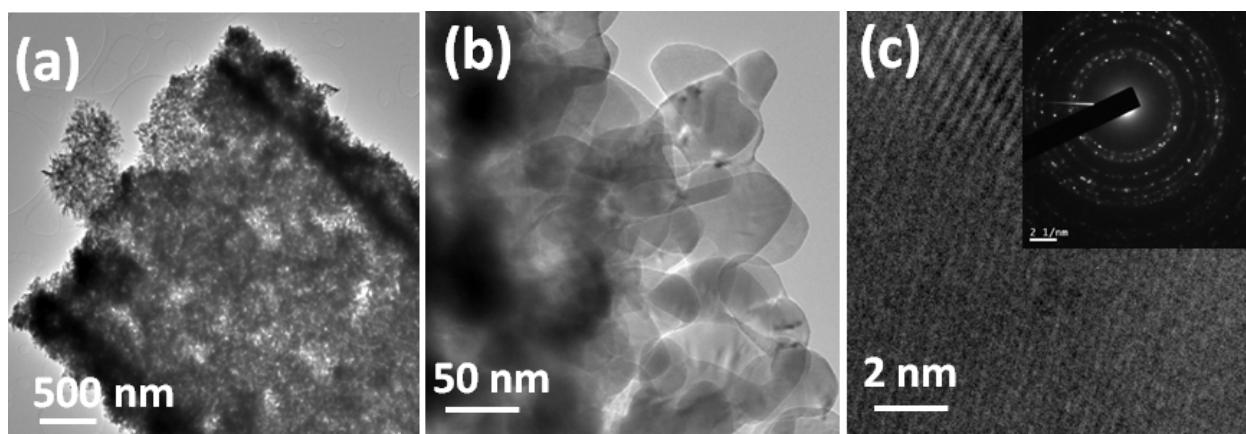


Fig. S3 TEM (a, b) and HRTEM (c) images of the synthesized ZnO microtubes obtained on calcination (500 °C for 2 h) of corresponding hydrozincite microtube. Inset of (c) represents the corresponding SAED pattern.

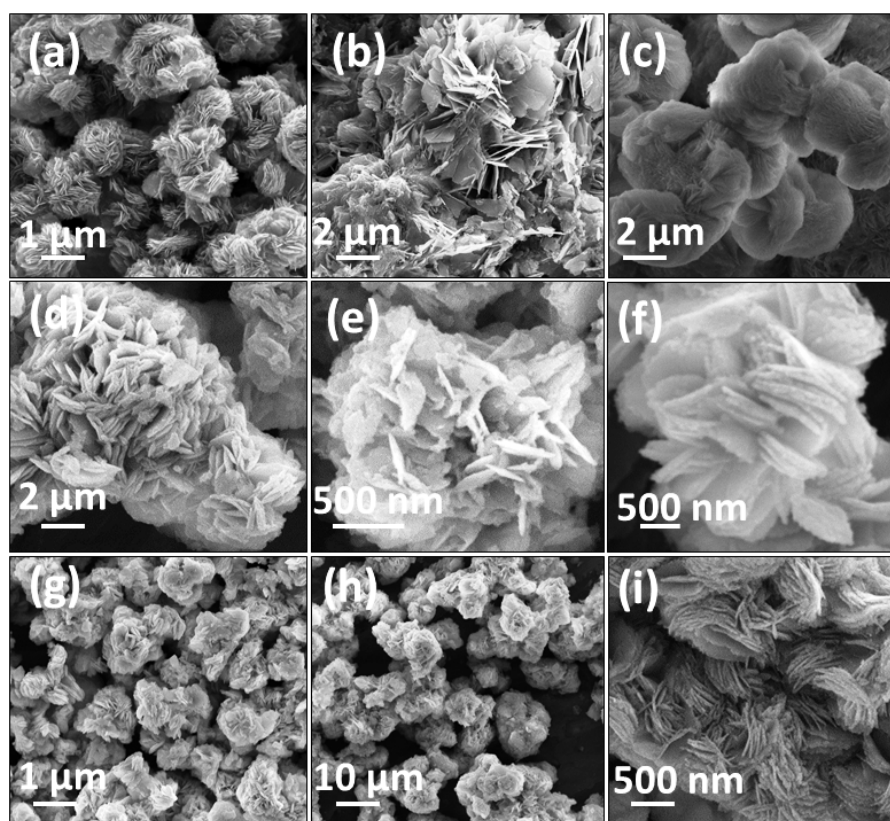


Fig. S4 SEM images of bare ZnO with woolen thread (a), nest like structure (b) and Flakes towards flower (c); corresponding ZnO@ZnS heterostructure with woolen thread (d), nest like structure (e) and Flakes towards flower (f) morphology obtained after sulfidation of respective ZnO using Na_2S for 2h; Corresponding ZnS morphology of woolen thread (g), nest like structure (h) and Flakes towards flower (i) obtained after leaching of ZnO from respective ZnO-ZnS heterostructure using acetic acid.

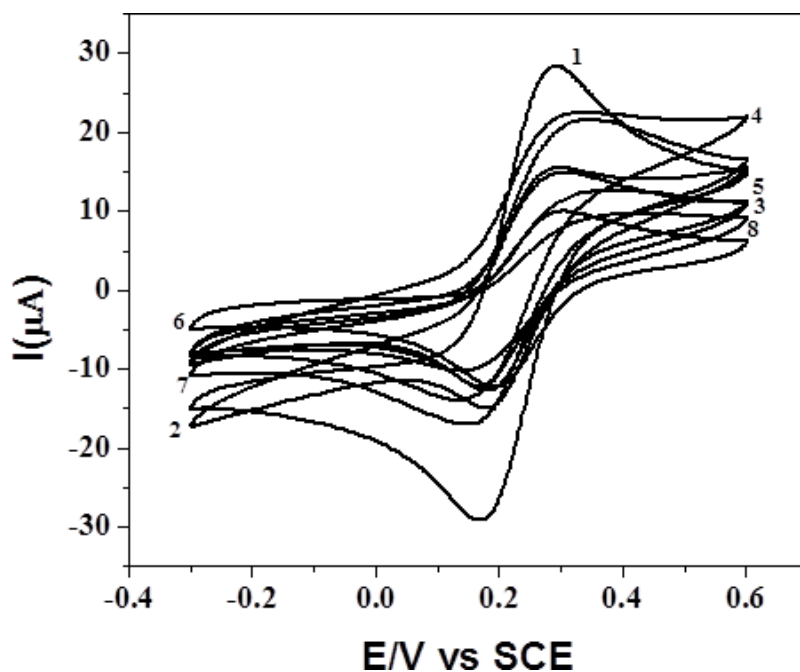


Fig. S5 CVs of different ZnO, ZnS and ZnO@ZnS modified bioelectrodes at a scan rate 50 mV s^{-1} . 1: ZnO@ZnS (microtube); 2: ZnS (microtube); 3: ZnO@ZnS(woollen thread); 4: ZnS (woollen thread); 5: ZnS (Nest like structure); 6: ZnO@ZnS (Nest like structure); 7: ZnS (Flakes towards flowers); and 8: ZnO@ZnS(Flakes towards flowers).

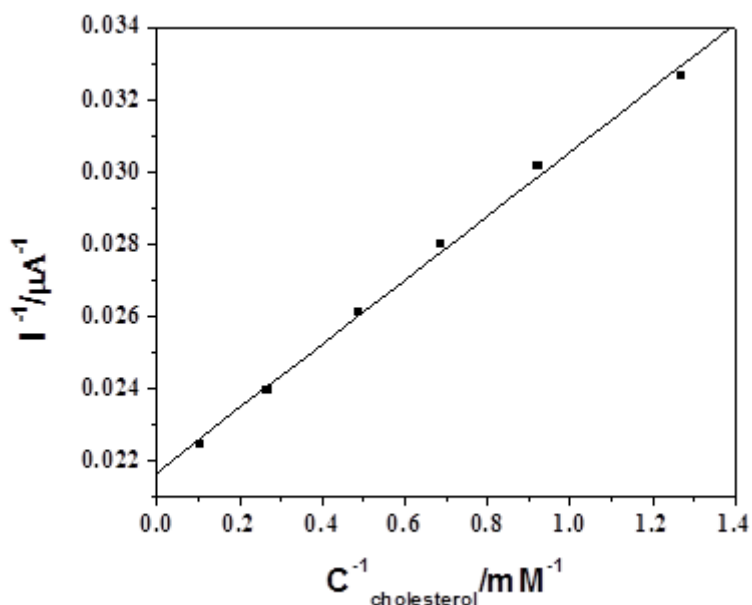


Fig. S6 Lineweaver-Burk plot for peak current response during cholesterol sensing.

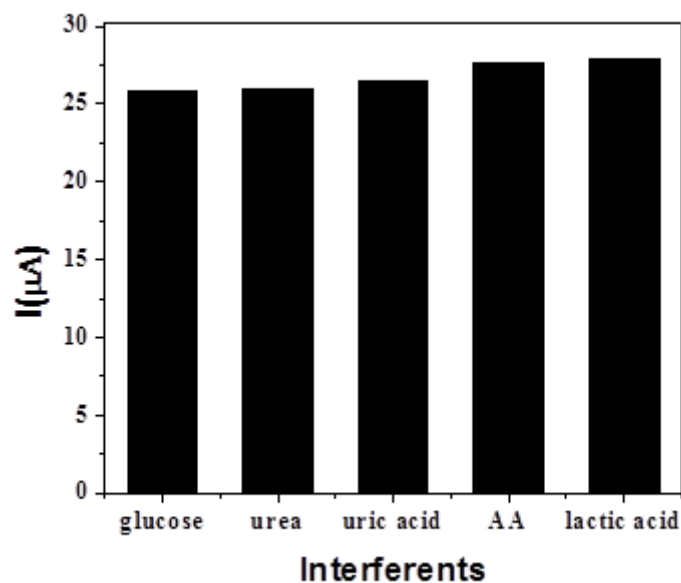


Fig. S7 Effect of Interference on ChOx/Chit./ZnO@ZnS/GCE bioelectrode during cholesterol sensing.

Table S1. Comparison of the performances of various types of cholesterol biosensors.

Electrode materials	Sensitivity ($\text{mA.M}^{-1} \text{cm}^{-2}$)	LOD (mM)	Reference
ZnO microtube	54.5	0.200	1
Pt-Au@ZnONRs	26.8	30	2
MWCNTs/SiO ₂ -CS	3.8	0.016	3
MWNTs-Au/PPD	0.559	0.200	4
DTSP-Au	0.054	0.022	5
polypyrrole	0.044	-	6
PANI-MWCNTs	6.8	-	7
Au Nanowire	0.85	-	8
ZnO@ZnS microtube	52.67	0.02	Present work

Reference.

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