Electronic Supplementary Information

Fe(III) incorporated porphyrin-based conjugated organic polymer as peroxidase-mimic for sensitive determination of glucose and H_2O_2

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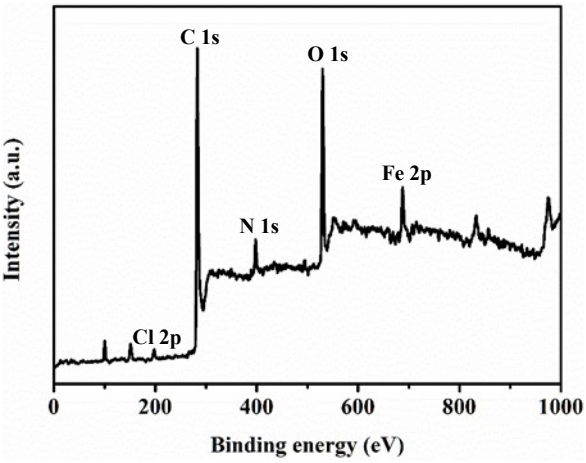

Fig. S1 Survey spectra of Fe-DMP-POR

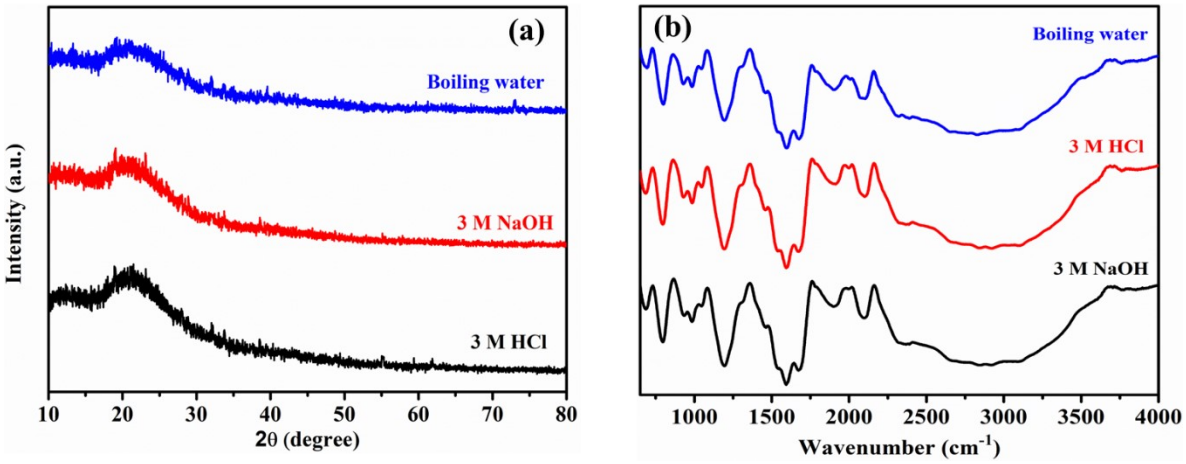

Fig. S2 (a) PXRD and (b) FT-IR of Fe-DMP-POR after treatment with 3 m NaOH, 3 M HCl and boiling water

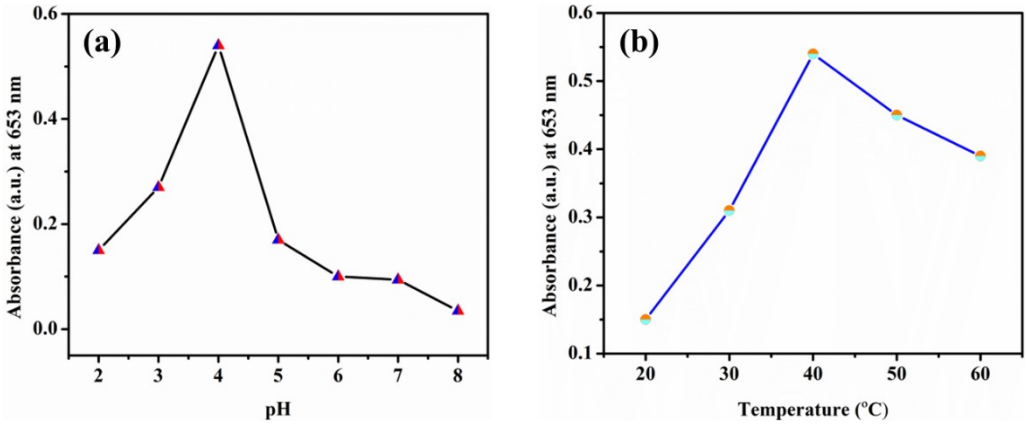

Fig. S3 (a) Optimisation of pH and (b) optimisation of temperature for peroxidase like activity

Table S1. Comparison of kinetic parameters like K_m and V_{max} with other reported materials

Catalyst	Substrate	K_m (mM)	V_{max} (10^{-8} Ms^{-1})	Reference
Fe-DMP-POR	TMB	0.14	1.44	This work
	H_2O_2	16.9	4.50	
HRP	TMB	100	5.71	1
	H_2O_2	142	1.33	
Au/OMC	TMB	0.015	1.50	2
	H_2O_2	38.11	4.00	
$CePO_4$-CeO_2 composite nanorods	TMB	0.236	8.78	3
	H_2O_2	4.76	29.79	
Bi_2Te_3-Au_5	TMB	0.261	2.15	4
	H_2O_2	11.36	4.48	

Table S2. Comparisons of different glucose sensing parameters

Catalyst	Linear range (mM)	LOD (μM)	Reference
Fe-DMP-POR	0-0.150	4.84	This work
PVP-MoS_2 nanoparticles	1-10	320	5
$NiCo_2S_4$ Microflowers	0.02-1	6.24	6
MoS_2 nanoflakes	0.1-1	33.51	7.
Bi_2Te_3-$Au_{0.5}$	0-4.5	380	4
$CePO_4$–CeO_2	0-0.1	4.1	3
Core–shell Cu/Au NPs	0.02-0.670	15	8
Fe_3O_4@Au–Pt	0.00005–0.140	0.025	9

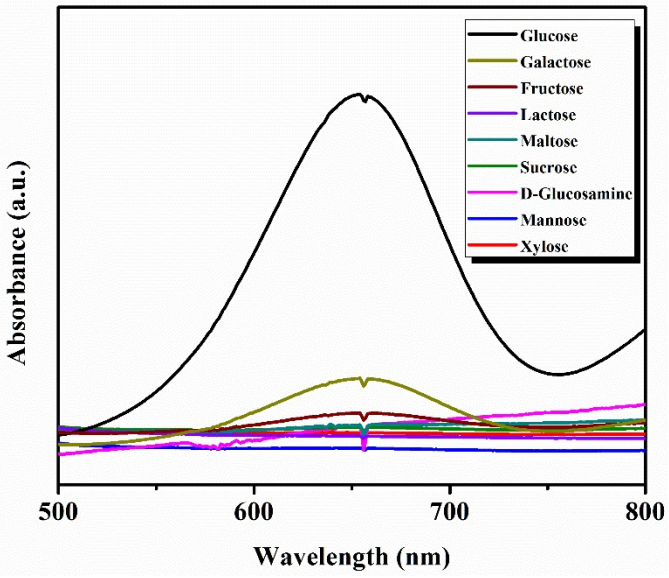

Fig. S4 UV spectra of solutions containing different monosaccharides and glucose

Table S3. Detection of glucose in blood serum samples

Sample No.	Spiked glucose/mM	Recovered glucose/mM	RSD/%	Recovery/%
1	0.05	0.051	3.1	102
2	0.075	0.074	2.5	98
3	0.1	0.103	2.8	103
4	0.15	0.16	3	106

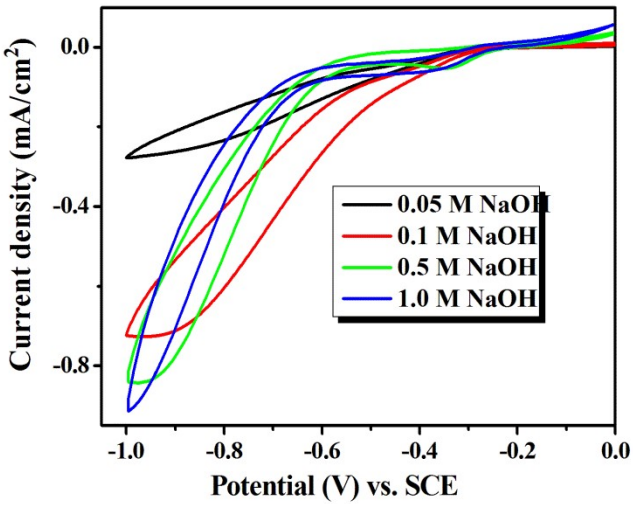

Fig. S5 Optimisation of NaOH concentration for H_2O_2 detection

Table S4. Comparison of different parameters for amperometric peroxide detection with other materials.

Modified electrodes	Linear range (mM)	Sensitivity ($\mu A\ cm^{-2}\ mM^{-1}$)	Limit of detection (μM)	Reference
$Pd–TiO_2$	1-20	550	23	10
Ag_{dahlia}	upto 15 mM	330	2.2	11
CuS/RGO	0.001-1	7.96	0.3	12
α-Fe_2O_3	0.050-1.340	24	5	13
Ag-MnO_2-MWCNTs/CGE	upto 10.4 mM	82.5	1.7	14
RGO/Fe_3O_4	upto 6 mM	688	3.2	15
Fe-DMP-POR	0.005-2	947.67	3.16	This work

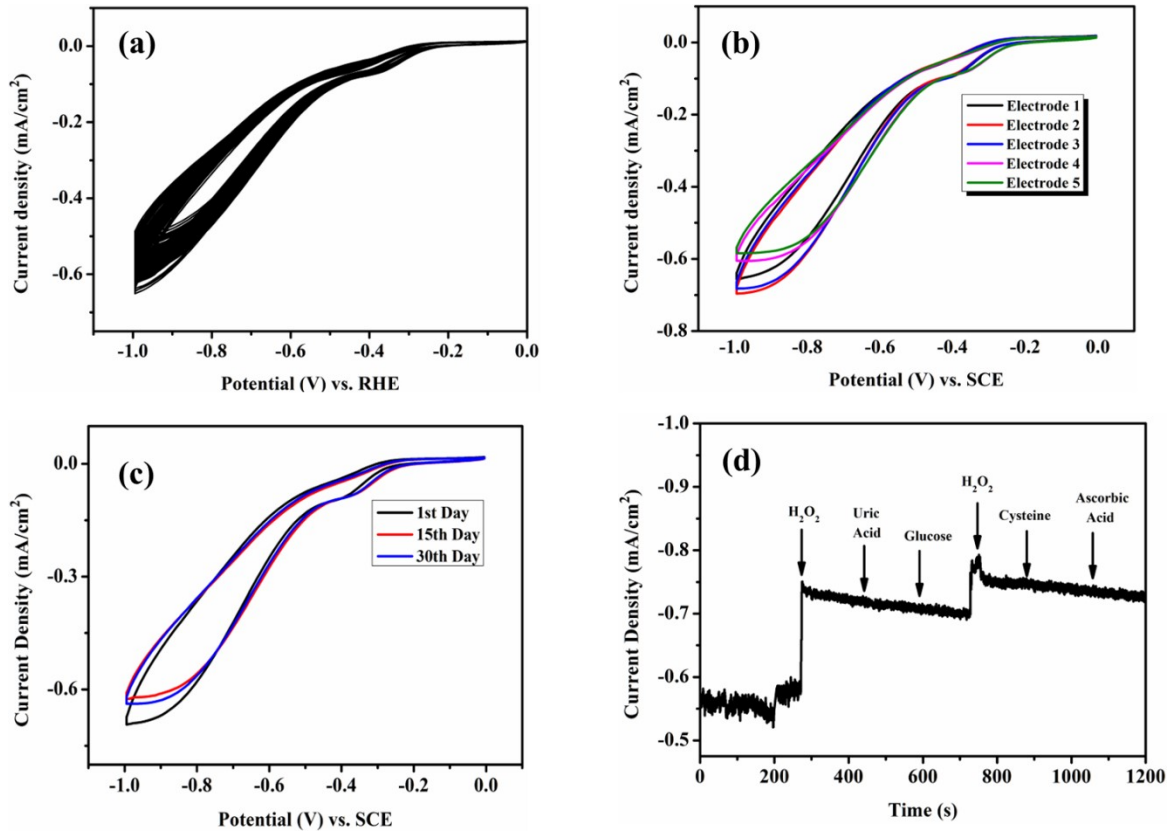

Fig. S6 (a) Repeatability study, (b) Fabrication reproducibility (five electrode), (c) long term stability study of Fe-DMP-POR in 0.1 M NaOH and H_2O_2 and (d) selectivity study of Fe-DMP-POR for uric acid glucose, cysteine and ascorbic acid at -0.78 V in 0.1 M NaOH

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