

Supporting information

A novel H₂O₂ biosensor based on

three-dimensional micro/nano-biointerfaces

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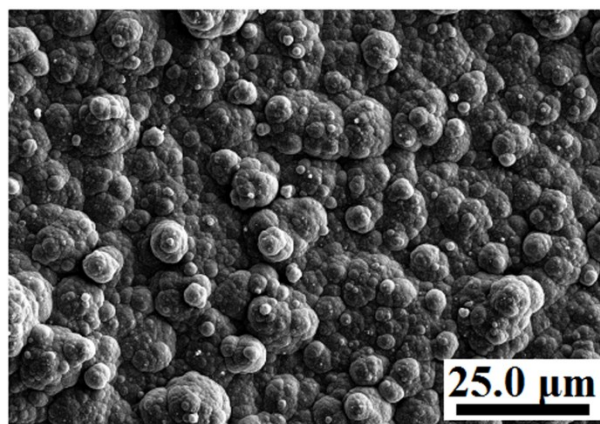


Fig. S1. SEM image of cPPy film.

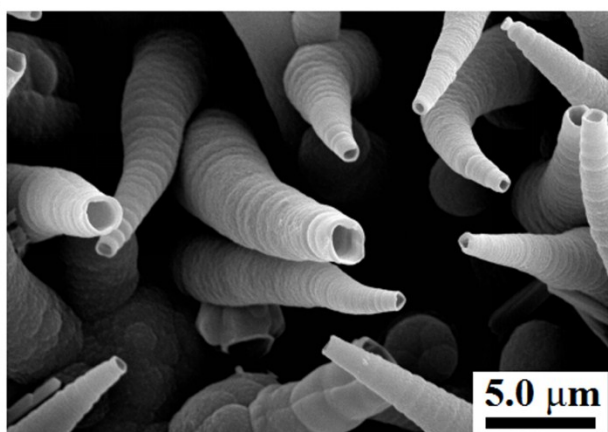


Fig. S2. Enlarged SEM image of hPPy film.

Table S1. Elemental surface analysis (by EDS spectrum) of MnO₂/hPPy film.

Sample	C [wt%]	O [wt%]	N [wt%]	Mn [wt%]
MnO ₂ /hPPy film	23.46	72.13	3.26	1.15

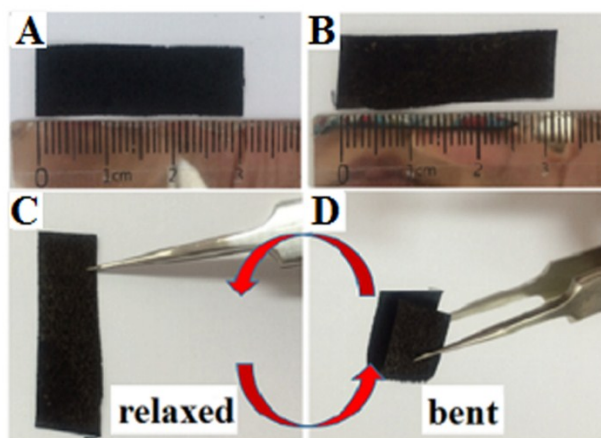


Fig. S3. Optical photographs of hPPy film (A) and MnO₂/hPPy film (B); the relaxing (C) and bending (D) conditions of MnO₂/hPPy array film.

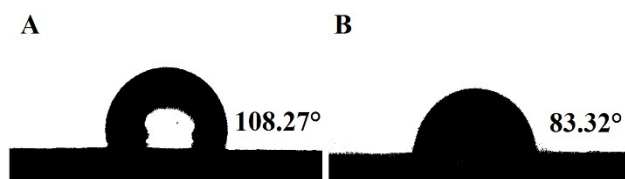


Fig. S4. The water contact angle tests of hPPy film (A) and (B) MnO₂/hPPy film.

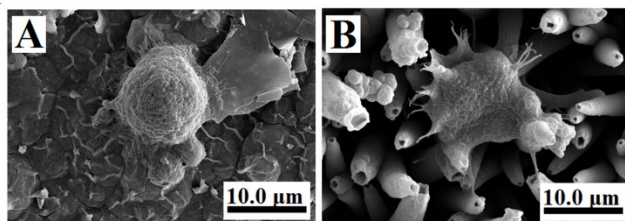


Fig. S5. SEM images of a single cell cultured on (A) cPPy film, (B) hPPy array film.

Table S2. Comparison of different nonenzymatic H₂O₂ sensors of sensitivity.

H ₂ O ₂ biosensor ^a	Sensitivity ($\mu\text{A cm}^{-2} \mu\text{M}^{-1}$)	Ref.
MnO ₂ -ERGO paper	59.0	(1)
Ag-MnO ₂ -MWCNTs nanocomposites	82.5	(2)
2D-assembly of Au NPs coated on graphene paper	236.8	(3)
Functionalized 3D graphene	169.7	(4)
Pt/rGO-CNT paper	1.4	(5)
MnO ₂ /hPPy film	280.8	This work

^aMWCNTs : multi walled carbon nanotubes; 2D : two-dimensional; NPs : nanoparticles.

Table S3. Comparison of different nonenzymatic H₂O₂ sensors of detection limit.

H ₂ O ₂ biosensor	detection limit (μ M)	Ref.
graphene/Au nanoparticles/toluidine blue O films	0.2	(6)
Pt/carbon nanotube nanocomposite	1.5	(7)
Se/Pt-nanocomposites	3.1	(8)
PtAu/graphene-sheets-MWCNTs	0.6	(9)
Pt/graphene-nanocomposite	0.8	(10)
MnO ₂ /hPPy film	0.076	This work

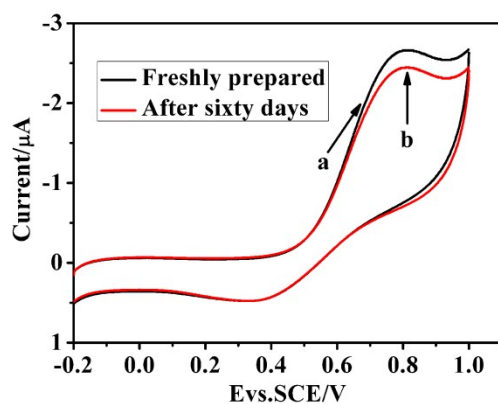


Fig. S6. CVs of MnO₂/hPPy film (a) Freshly prepared and (b) after sixty days with 10.0 mM H₂O₂ in 0.1 M PBS at a scan rate of 100 mV • s⁻¹.

References

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