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Supplementary Information

Dendritic platinum-decorated gold nanoparticles for non-enzymatic glucose biosensing

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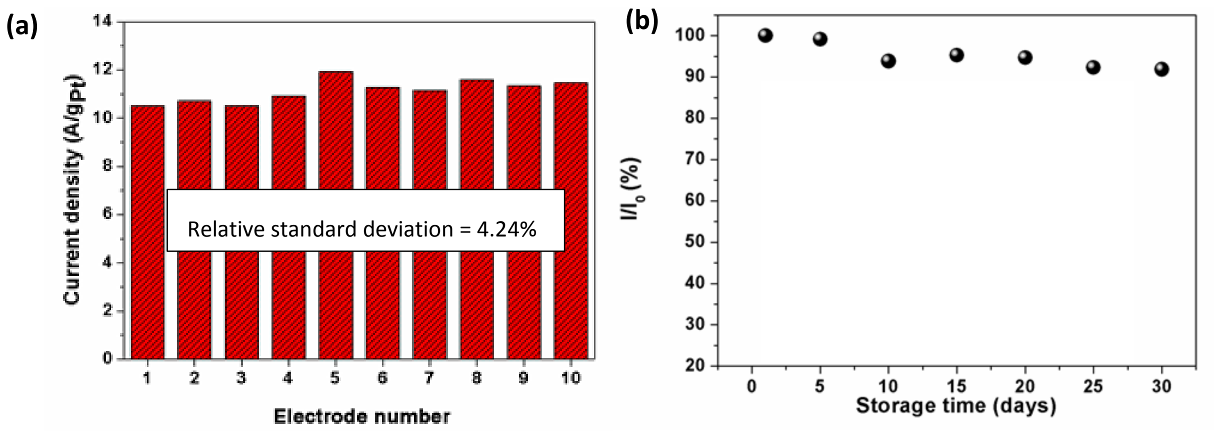

Figure S1 (a) Reproducibility of the current responses of 10 different Nafion/Au_{rod}@Pt/GCE sensor electrodes to 6 mM glucose in 0.1 M PBS (pH= 7.4) containing 0.1 M KCl, at +0.20 V (vs. Ag/AgCl); (b) 30-day stability test, where the electrode was stored at room temperature in the dry state when not in use, test condition: 10 mM PBS (pH 7.4) containing 6 mM glucose and 100 mM KCl. at 0.2 V (vs. Ag/AgCl)

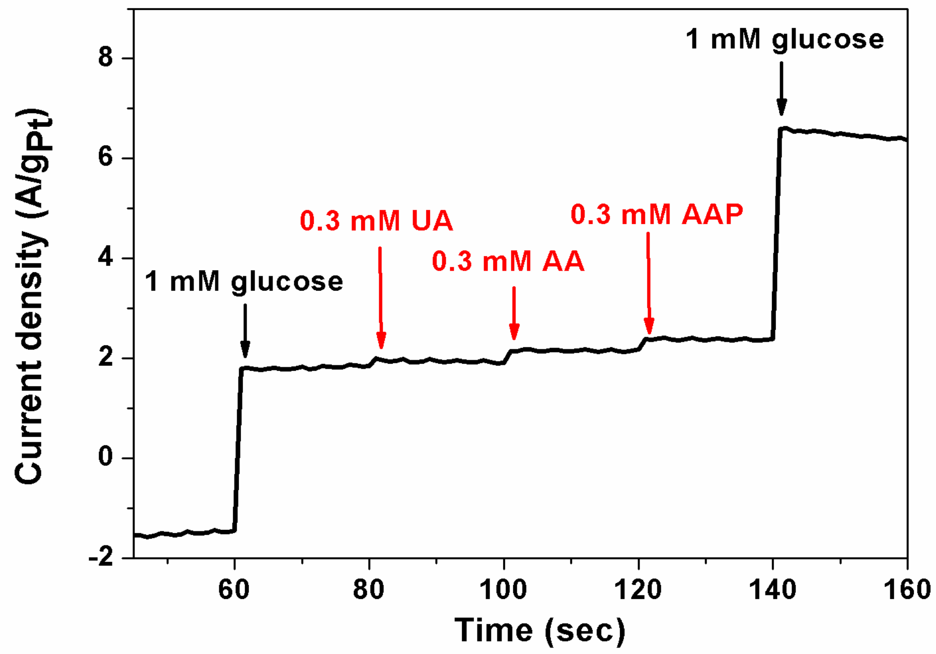

Figure S2. Interference tests for electroactive species (0.3 mM UA, AA, and AAP) tested in 0.1 M PBS (pH 7.4) containing 0.1 M KCl at +0.20 V (vs. Ag/AgCl).

A few Pt-based and bimetallic non-enzymatic glucose sensors published in recent years are summarized in Table R1. It is interesting to note that the sensitivity of reported sensors outperform most of the known methods for glucose sensing at a lower working potential. It shows the advantages of the bimetallic composite sensor brought by the carefully designed composition and morphology. The electron transfer effect mimics the role of an enzyme and the whole sensing platform can perform with significantly improved sensitivity, stability and selectivity.

Table R1 List of recent platinum-based and bimetallic non-enzymatic glucose sensors

Electrode composition	Sensitivity (μA mM^{-1} cm^{-2})	Linear range (mM)	LOD (μM)	Working potential (vs. Ag/AgCl)	Medium	Year	Ref.
Nafion/dendritic Pt-Au NPs/GCE	31.17*	0.5-7.5	500 (tested limit)	+0.2 V	0.1 M PBS (pH 7.4)	2013	This work
Nation/dendritic Pt/GCE	24.92*	0.5-5	500 (tested limit)	+0.2 V	0.1 M PBS (pH 7.4)	2013	This work
Pt nanoflowers electrode	1.87	1-16	48	+0.03 V	0.2 M PBS (pH 7.0)	2012	[1]
Porous Pt-disk electrode	25.2	1-16	N.A.	+0.35 V	0.05 M PBS (pH 7.4)	2011	[2]
Au-Pt hybrid	39.53	1-20	25	+0.4 V	0.1 M PBS (pH 7.4)	2011	[3]
$Pt_{50}Au_{50}$/MWCNTs	10.71	Up to 24.44	10	+0.3 V	PBS (pH 7.4)	2010	[4]
PtAu/C nanocomposites	4.7	0-10	2	+0.35 V	PBS (pH 7.4)	2010	[5]
$Au_{95}Ru_5$ NPs	38.3	0-15	269	-0.65 V	0.1M NaOH	2010	[6]
PtRu/MWCNTs/IL	10.7	0.2-15	50	-0.1 V vs SCE	0.1 M PBS (pH 7.4)	2009	[7]
3D Pt nanoporous	642	0.1-1.5	N.A.	+0.4 V	0.1 M PBS (pH 7.4)	2008	[8]
Pt nanoporous	291.0	0-10	N.A.	+0.4 V	0.1 M PBS (pH 7.4)	2008	[9]
Dendritic Pt	12.1	1.0-20	1.2	+0.5 V	PBS (pH 7.4)	2008	[10]
Nanoporous Pt	7.75 0.83 (packaged sensor)	N.A.	N.A.	+0.4 V	0.1 M PBS (pH 7.4)	2008	[11]
PtPb nanoporous networks	10.8	1-16.9	N.A.	+0.4 V	0.1 M PBS (pH 7.4)	2008	[12]

*Derived from the sensitivity mentioned on p9/p10 times the loading amount mentioned on p6 in manuscript.

Nafion/dendritic Pt-Au NPs/GCE: 2.106 A mM^{-1} gPt^{-1} X 1.48×10^{-5}g$_{Pt}$/cm^2 = 31.17 μA mM^{-1} cm^{-2}

Nation/dendritic Pt/GCE: 0.670 A mM^{-1} gPt^{-1} X 3.72×10^{-5}g$_{Pt}$/cm^2 = 24.92 μA mM^{-1} cm^{-2}

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