

SUPPORTING INFORMATION

Decorating graphene/nanogold with dextran-based polymer brushes for the construction of ultrasensitive electrochemical enzyme biosensors

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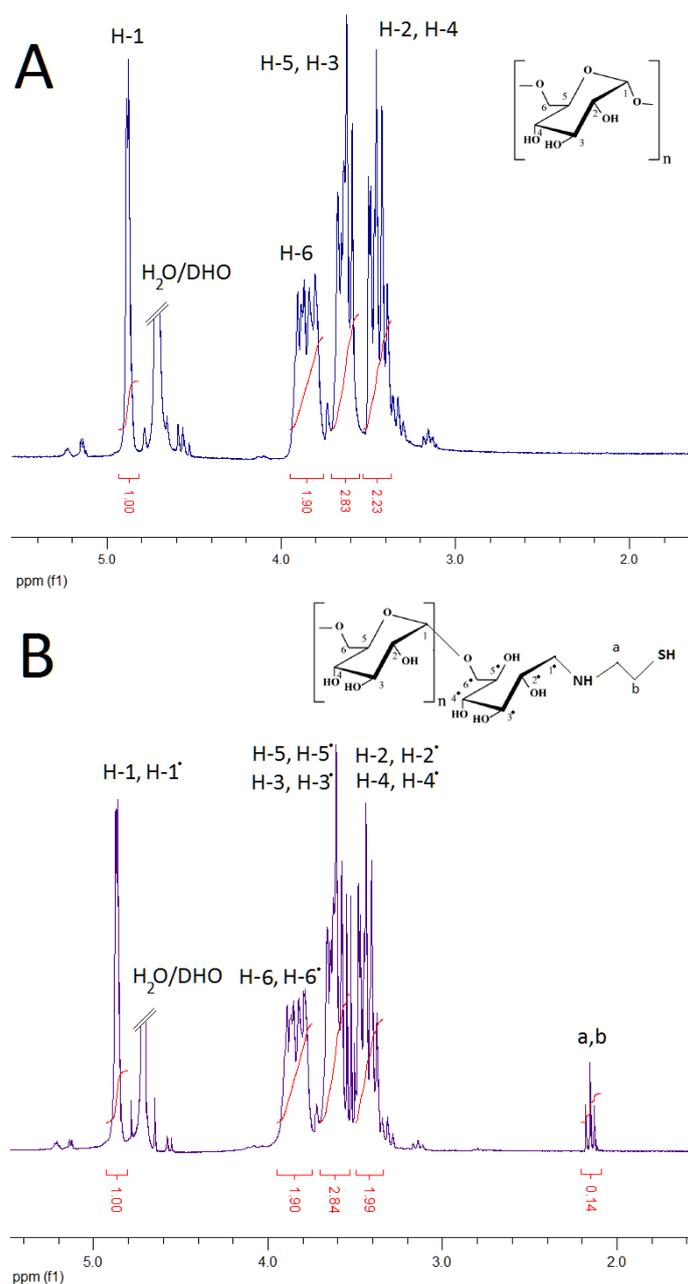


Figure 1S. ¹H-RMN spectra of dextran (A) and dextran-cysteamine (B).

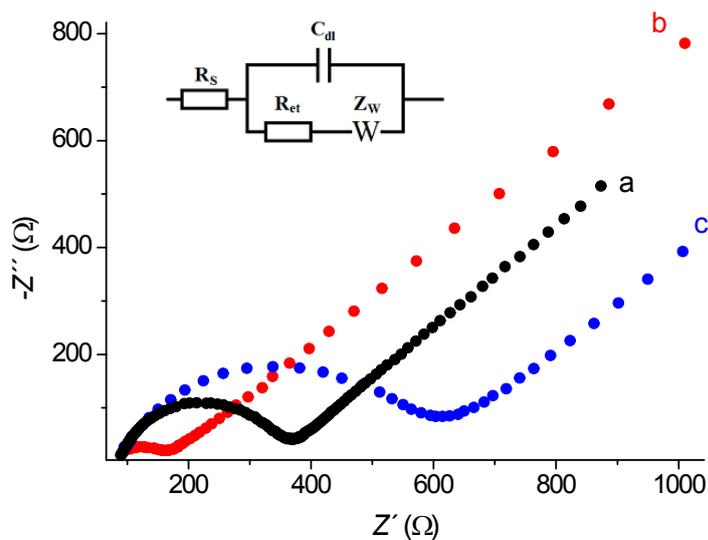


Figure 2S. Electrochemical impedance spectra obtained at a glassy carbon electrode before (a) and after coating with Dex-Au-Sil-rGO (b) and further immobilization of tyrosinase (c), in 0.1 M KCl solution containing 5 mM K₃[Fe(CN)₆]/K₄[Fe(CN)₆] (1:1).

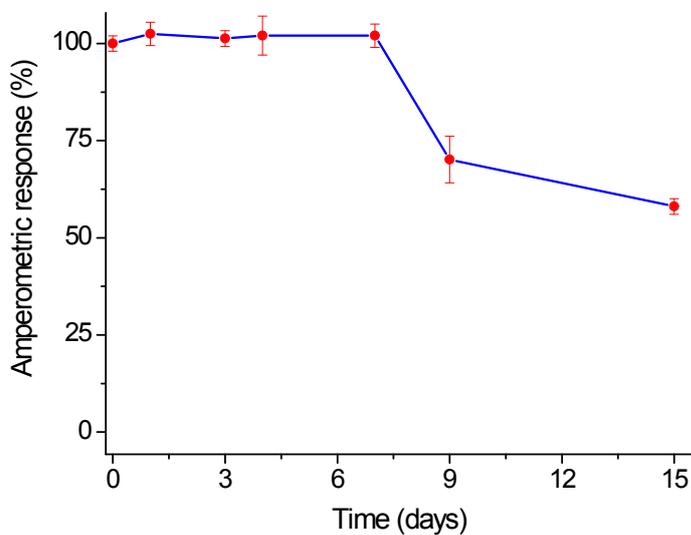


Figure 3S. Effect of time of storage at 4°C on the amperometric response of the biosensor.

Table 1S. Analytical properties of graphene-based tyrosinase biosensors for catechol.

Electrode	Linear Range (M)	Limit of Detection (M)	Sensitivity (mA·M⁻¹ / A·M⁻¹·cm⁻²)
Tyr-Au/PBA-GO/SPE¹	8.3x10 ⁻⁸ – 2.3x10 ⁻⁵	2.4x10 ⁻⁸	160 / 5.16
Tyr-GR-SP/ GCE²	1x10 ⁻⁹ – 1.7x10 ⁻⁵	2.3x10 ⁻¹⁰	-
Tyr/TNT/GNPs/GCE³	3x10 ⁻⁷ – 1.1x10 ⁻⁴	5.5x10 ⁻⁸	150 / 2.14
Tyr/GR-chitosan/GCE⁴	1x10 ⁻⁶ – 4x10 ⁻⁴	7.5x10 ⁻⁷	69 / 0.99
Tyr/PAMAM- rGO/GCE⁵	1x10 ⁻⁸ – 2.2x10 ⁻⁵	6x10 ⁻⁹	424 / 6.06
Tyr/rGO/SPE⁶	2x10 ⁻⁶ –1.6x10 ⁻⁵	1x10 ⁻¹¹	89.8 / -
Tyr/CMC-rGO/GCE⁷	2x10 ⁻⁶ –5.6x10 ⁻⁵	2x10 ⁻¹⁰	270 / 3.86
Tyr/Dex-Au-Sil-rGO/GCE (this work)	1x10 ⁻¹⁰ – 1.2x10 ⁻⁷	4x10 ⁻¹¹	45900 / 656

Tyr: tyrosinase; Au: Au nanoparticles; PBA: 1-pyrenebutanoic acid; GO: graphene oxide; SPE: screen-printed electrode; GR: graphene; SP: silk peptide; TNT: TiO₂ nanotubes; GNPs: graphene nanoplatelets; GCE: glassy carbon electrode; PAMAM: PAMAM G-4 dendrimer; rGO: reduced graphene oxide; CMC: carboxymethyl cellulose; Dex: dextran; Sil: 3-mercaptopropyl trimethoxysilane.

References

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