

Supplementary material

Anti-human albumin monoclonal antibody immobilized on EDC-NHS functionalized carboxylic graphene/AuNPs composite as promising electrochemical HSA immunosensor

Vesna Stanković^{1*}, Slađana Đurđić², Miloš Ognjanović³, Bratislav Antić³, Kurt Kalcher⁴,
Jelena Mutić², Dalibor M. Stanković^{3*}

¹*Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoseva 12, 11000 Belgrade, Serbia*

²*Faculty of Chemistry, University of Belgrade, Studentski trg 12-16, Belgrade, Serbia*

³*The “Vinča” Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia*

⁴*Institute of Chemistry – Analytical Chemistry, Karl-Franzens University Graz, Graz, Austria*

* corresponding authors: Vesna Stanković, Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Njegoseva 12, 11000 Belgrade, Serbia. Email: vvukojevic@chem.bg.ac.rs Phone: 00381 11 3336829

Dalibor Stanković, The “Vinča” Institute of Nuclear Sciences, University of Belgrade, POB 522, 11001 Belgrade, Serbia. Emails: dalibors@chem.bg.ac.rs daliborstankovic@vin.bg.ac.rs Phone: 00381 11 3336829

Table S1. A comparison of the electrocatalytic performances of developed immunosensor with other sensors for HSA detection

Table S2. Concentration of albumin in urine samples detected with anti-HSA/EDC+sulfo NHS/Au@CGR-SPCE and recovery experiments

Fig. S1. Specificity of the immunosensor toward glucose, uric acid, paracetamol and bovine serum albumin. The concentration of HSA is 50 $\mu\text{g/mL}$ and for Glu, UA, Para and BSA is 1 mg/ml

Fig. S2. The reproducibility study of the proposed immunosensors with five electrodes fabricated at the same conditions (50 $\mu\text{g/mL}$ HSA solution)

Fig. S3. Screen printed carbon electrode

Table S1. A comparison of the electrocatalytic performances of developed immunosensor with other sensors for HSA detection

Sensor	Linear range ($\mu\text{g/mL}$)	LOD ($\mu\text{g/mL}$)	Reference
anti-HSA/EDC+NHS/COOH-P-SPCE	30-300	9.77	Tsai et al. 2016 [13]
PVA-HSA-Ab-AuNP	2.5-200	0.025	Omidfar et al 2011 [37]
ME immunosensor	0.01-100	0.01	Liu et al. 2019 [36]
Ab/GNPs/HDT/GNPs@MW-CILE	0.1–100	0.0154	Arkan et al. 2014 [35]
HSA-imprinted sensor	20 -100	3.7	Stojanovic et al. 2017 [3]
BSA/AHSA/APTES/glass immunosensors	optical 0.2-200	0.032	Tu et al. 2012 [38]
anti-HSA/EDC+sulfo SPCE	NHS/Au@CGR- 2.5 – 500	1.55	This work

Table S2. Concentration of albumin in urine samples detected with anti-HSA/EDC+sulfo NHS/Au@CGR-SPCE and recovery experiments

	HSA ($\mu\text{g/mL}$)	Added ($\mu\text{g/mL}$)	Found ($\mu\text{g/mL}$)	Recovery (%)
Sample 1	5.21 \pm 0.55	10.00	15.95	105
Sample 2	6.80 \pm 1.20	10.00	17.51	104
Sample 3	16.65 \pm 0.85	10.00	27.92	105

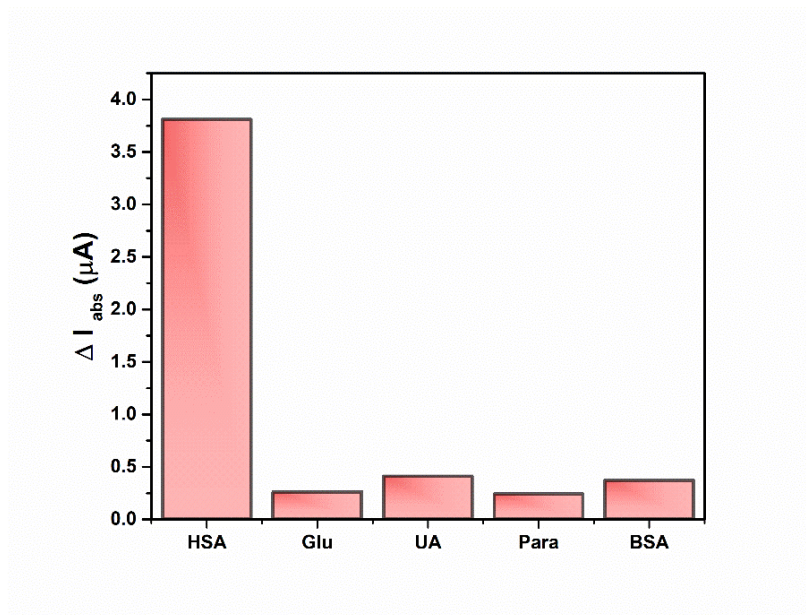


Fig. S1. Specificity of the immunosensor toward glucose, uric acid, paracetamol and bovin-serum albumin. The concentration of HSA is 50 $\mu\text{g/mL}$ and for Glu, UA, Para and BSA is 1 mg/mL

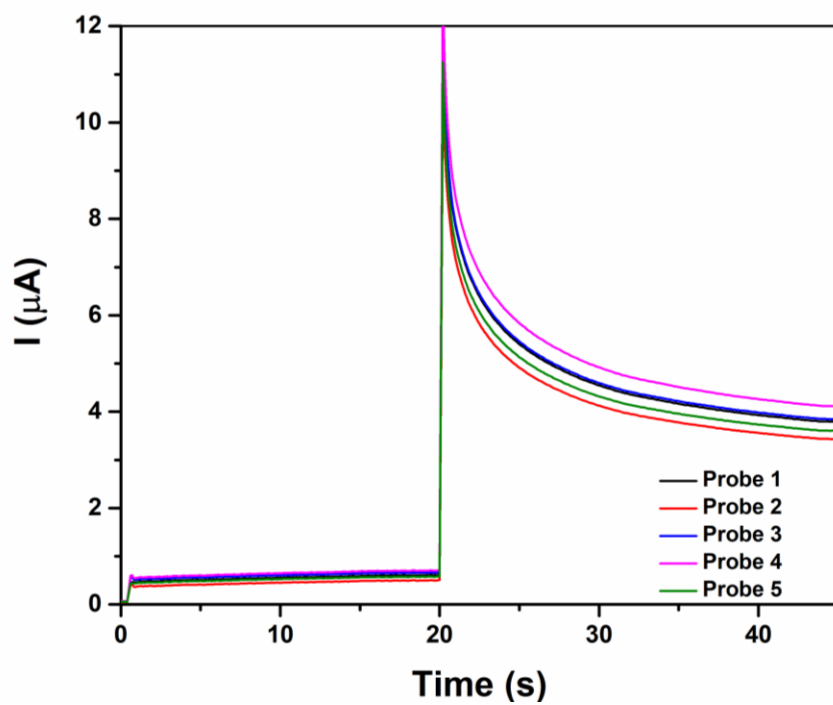


Fig. S2. The reproducibility study of the proposed immunosensors with five electrodes fabricated at the same conditions (50 $\mu\text{g/mL}$ HSA solution)



Fig. S3. Screen printed carbon electrode