

SUPPORTING MATERIAL

Gold-coated micellar composites as colorimetric probes for the determination of low molecular weight thiols in biological fluids using consumer electronic devices

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Preparation of artificial and simulated body fluids

Artificial urine solution (AUS) was prepared by mixing 12 mM Na_2SO_4 , 1.5 mM uric acid, 2.45 mM trisodium citrate dihydrate, 7.8 mM creatinine, 250 mM urea, 31 mM KCl, 30 mM NaCl, 1.66 mM CaCl_2 , 23.67 mM NH_4Cl , 0.19 mM potassium oxalate hydrate, 4.4 mM $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, 18.7 mM $\text{NaH}_2\text{PO}_4 \cdot 2\text{H}_2\text{O}$ and 4.7 mM $\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$ and adjusting the pH at the value of 6.0 ± 0.2 [S1,S2]. Artificial blood plasma (ABP) contained 137.5 mM NaCl, 4.2 mM sodium hydrogen carbonate, 3.0 mM KCl, 0.5 mM disodium hydrogen phosphate, 0.5 mM MgCl_2 , 2.64 mM CaCl_2 and 0.5 mM NaSO_4 in distilled water and adjusting the pH at the value of 7.4 [S2]. Simulated blood plasma (SBP) was prepared by enrichment of ABP with bovine serum albumin (40 g/L), glucose (5.0 mM), urea (3.0 mM), uric acid (220 μM) and a mixture of common amino acids found in blood plasma (0.4 mM of glutamine, glycine, valine, arginine, lysine and alanine; total concentration of 2.4 mM) [S3]. All artificial and simulated body fluids were fortified with cysteine (at variable concentrations depending on the needs of the analysis), which the most abundant biothiol species in biological fluids.

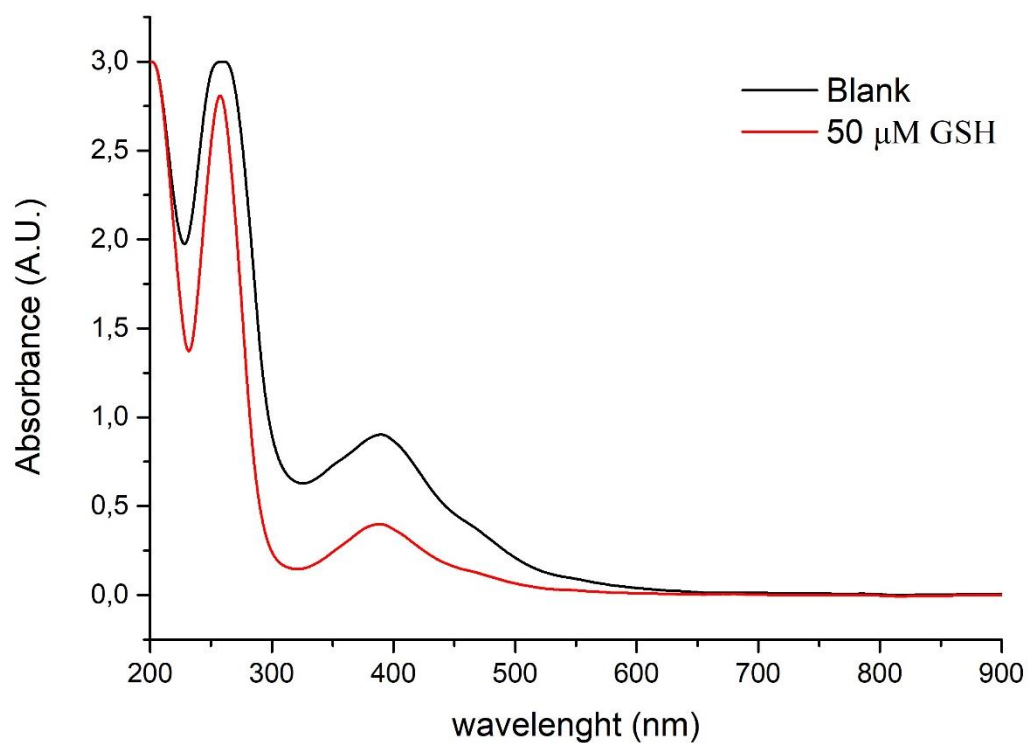


Figure S1. Absorbance spectra of Au-CTAB complex (black line) and Au-CTAB in the presence of 50 μM of glutathione. No peaks above 500 nm are observed suggesting that gold has not been reduced to its respective gold nanoparticle species under the optimum experimental conditions (0.25mM AuCl_4^- , 10 mM CTAB, 50 μM GSH, sodium acetate/acetic acid buffer pH 6, 15 min incubation time at room temperature).

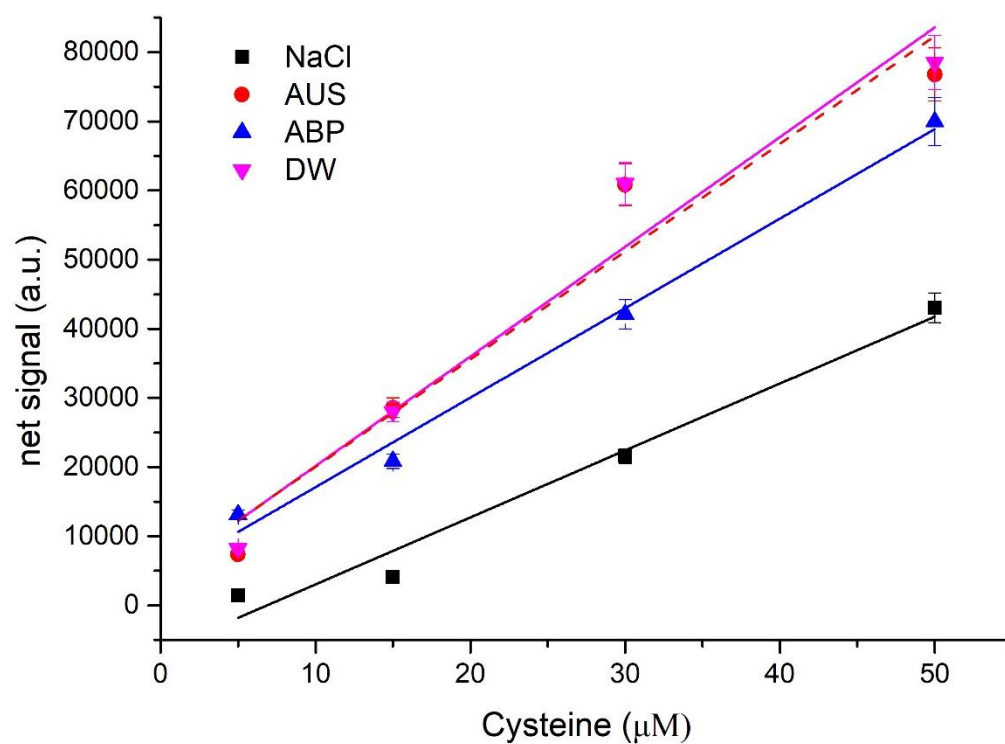


Figure S2. Response of the colorimetric assay in various artificial biofluids. The linear curves are the result of linear regression while error bar represent the standard error calculated for triplicate samples. AUS: Artificial urine solution, ABP: artificial blood plasma, DW: distilled water.

References for the Supporting Material

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- [S2] N. Sarigul, F. Korkmaz, İ. Kurultak, A new artificial urine protocol to better imitate human urine, *Sci. Rep.* 9 (2019) 20159.
- [S3] L. Liu, C.L. Qiu, Q. Chena, S.M. Zhang, Corrosion behavior of Zr-based bulk metallic glasses in different artificial body fluids, *J. Alloys Comp.* 425 (2006) 268–273.
- [S4] E. Gyori, I. Fábián, I. Lázár, Effect of the chemical composition of simulated body fluids on aerogel-based bioactive composites, *J. Compos. Sci.* 1 (2017) 15.