

## Supplementary Information

### Biocompatible ligands modulate nanozyme activity of CeO<sub>2</sub> nanoparticles

Alexander E. Baranchikov<sup>1,2</sup>, Madina M. Sozarukova<sup>1</sup>, Ivan V. Mikheev<sup>3</sup>, Anastasia A. Egorova<sup>1</sup>, Elena V. Proskurnina<sup>4</sup>, Iuliia A. Poimenova<sup>3</sup>, Svetlana A. Krasnova<sup>1,2</sup>, Arina D. Filippova<sup>1</sup>, Vladimir K. Ivanov<sup>1,2\*</sup>

<sup>1</sup>Kurnakov Institute of General and Inorganic Chemistry, Russian Academy of Sciences, Leninsky Prospect, 31, Moscow 119991, Russia

<sup>2</sup>National Research University Higher School of Economics, Pokrovsky Bulvar, 11, Moscow 109028, Russia

<sup>3</sup>Department of Chemistry, Lomonosov Moscow State University, Leninskie Gory, 1-3, GSP-1, Moscow 119991, Russia

<sup>4</sup>Research Centre for Medical Genetics, Moskvorechye St, 1, Moscow 115522, Russia

a.baranchikov@yandex.ru, s\_madinam@bk.ru, mikheev.ivan@gmail.com,  
ana.egorova13@ya.ru, proskurnina@gmail.com, poymenovajul@gmail.com,  
svetlanakr2002@mail.ru, arifilippova@yandex.ru, van@igic.ras.ru

### Outline

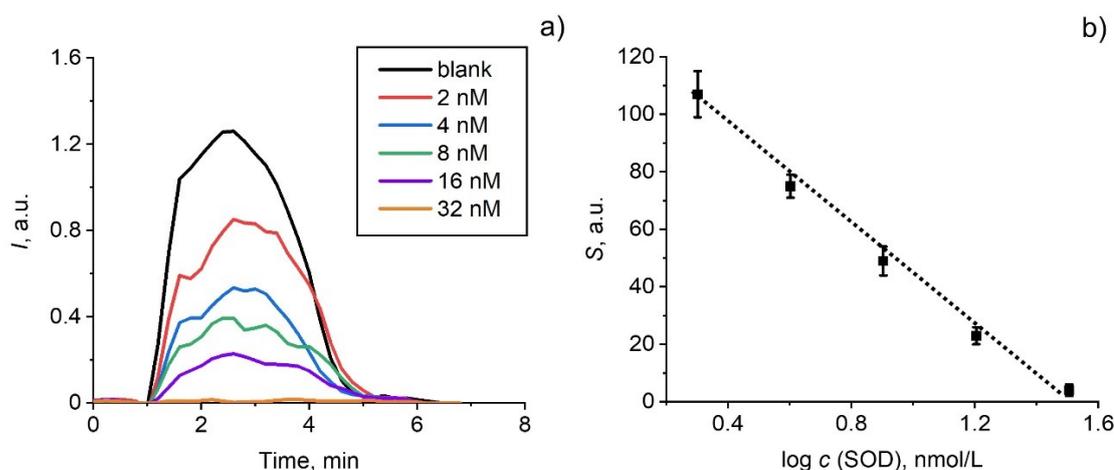
**S1** – Experimental dependence of the change in the parameter  $S$  on the concentration of SOD.

**S2** – Fluorescence spectra of CeO<sub>2</sub>@ $\gamma$ -IgG NPs.

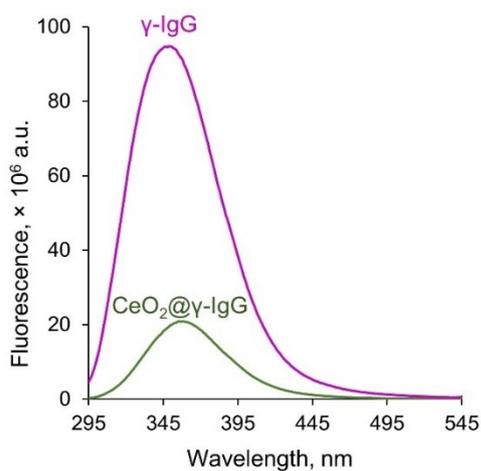
**S3** – Experimental dependencies of the change in the parameter  $S$  on the concentration of CeO<sub>2</sub> sols.

**S4** – Experimental dependence of the change in the parameter  $S$  on the concentration bare  $\gamma$ -IgG.

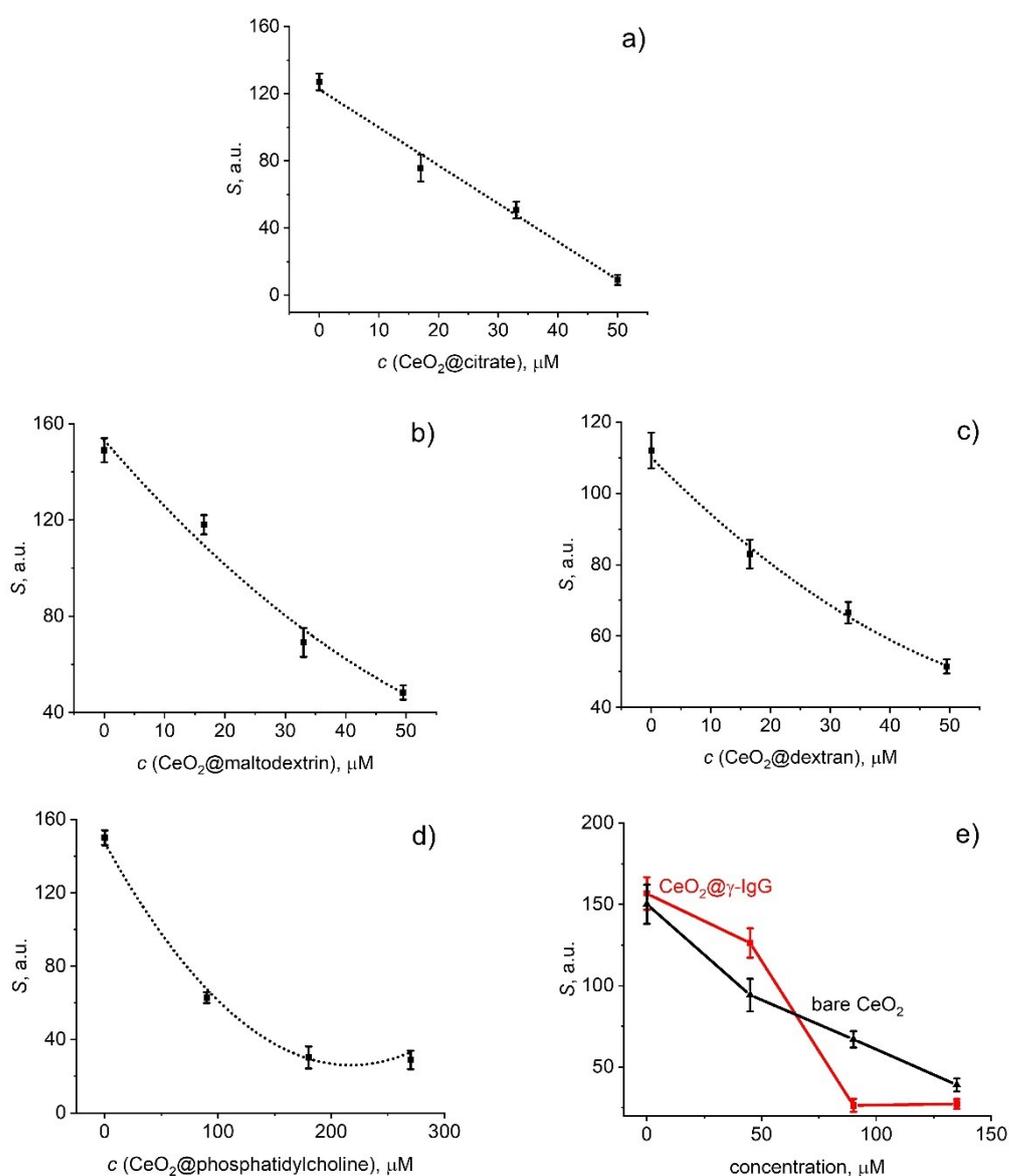
**S5** – Chemiluminograms for CeO<sub>2</sub>@ $\gamma$ -IgG NPs in a system with alkylperoxyl radicals and luminol.



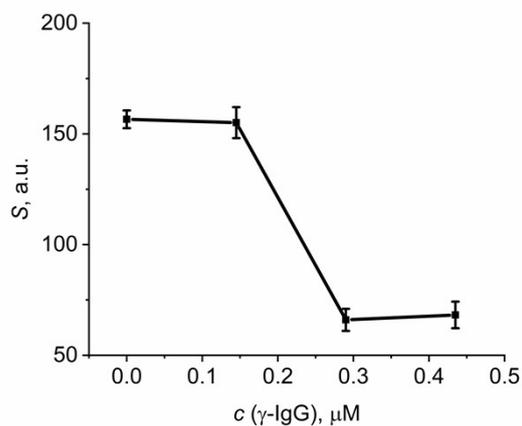
**Figure S1.** (a) Chemiluminograms of xanthine (20  $\mu$ M) oxidation with xanthine oxidase (4.4 mU/mL) in the presence of lucigenin (20  $\mu$ M) upon the addition of various amounts of superoxide dismutase (SOD); (b) the corresponding light sums plotted against SOD concentration.



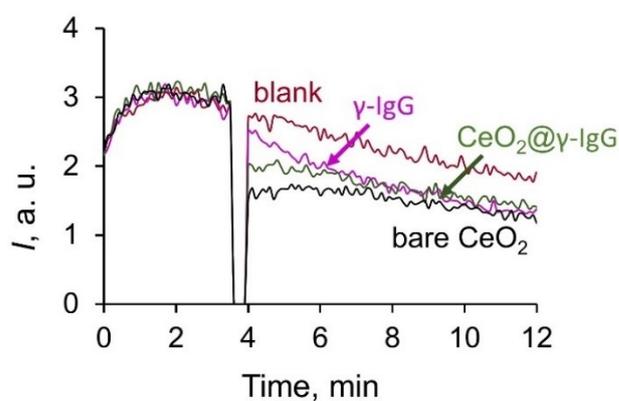
**Figure S2.** Fluorescence spectra ( $\lambda_{\text{ex}} = 280 \text{ nm}$ ) of  $\gamma$ -IgG ( $6.5 \mu\text{M}$ ) before and after loading with  $\text{CeO}_2$  nanoparticles.



**Figure S3.** Dependencies of light sums ( $S$ ) on the concentration of  $\text{CeO}_2$  modified with ammonium citrate (a), maltodextrin (b), dextran (c), phosphatidylcholine (d),  $\gamma$ -IgG (e).



**Figure S4.** Chemiluminescence light sum measured upon the addition of xanthine oxidase to the phosphate buffer solution containing xanthine, lucigenin and bare  $\gamma$ -IgG with various concentrations.



**Figure S5.** Chemiluminograms of bare  $\text{CeO}_2$  sol ( $90 \mu\text{M}$ ),  $\text{CeO}_2$  sol modified with  $\gamma$ -IgG ( $90 \mu\text{M}$ ) and an individual  $\gamma$ -IgG solution ( $0.3 \mu\text{M}$ ) after addition to a system containing luminol and alkyl peroxy radicals formed as a result of AAPH thermolysis.