Supplementary Materials

to the paper: *Diminished amyloid-β uptake by mouse microglia upon treatment with quantum dots, silver or cerium oxide nanoparticles* by Sikorska et al., 2019

Materials and Methods

Cell metabolic activity assay (MTT assay)

MTT assay, which measures activity of cytosolic and mitochondrial dehydrogenases that roughly corresponds to cellular viability, was used to evaluate toxicity of the nanoparticles. In brief, the cells were seeded in 96-well microplates (TPP, Switzerland) at a density of $4x10^3$ cells/well in 100 μL of culture medium. Next day, AgNPs, CdTeQDs or CeO_2NPs (5, 10, 25, 50 and 100 μg/mL) were added and incubated for 24 h at 37ºC in CO_2 incubator. After incubation, 20 μL of MTT (3-(4,5-dimetyl-2- thiazolyl)-2,5-diphenyl-2H-tetrazolium bromide), 5 mg/mL stock solution in PBS (pH = 7.0) was added to each well and incubated for 4 h at 37ºC. The formed formazan crystals were dissolved in 120 μL of DMSO:SDS (10%) 1:1 overnight in the CO_2 incubator. Finally, absorbance of the formazan was measured in a plate reader spectrophotometer (Infinite M200, Tecan, Austria), at a wavelength of 570 nm. The cell metabolic activity was expressed as a percentage of the absorbance of the treated cells in relation to control. IC_{50} value was calculated using GraphPad Prism 5.0 software (GraphPad Software, Inc., USA).

Table S1. The metabolic activity of microglia after 24-h treatment with NPs (MTT assay).

AgNPs (μg/mL)	**0**	**5**	**10**	**25**	**50**	**100**
% of metabolic activity	100	72	71	57	46	28
CdTeQDs (μg/mL)	**0**	**5**	**10**	**25**	**50**	**100**
% of metabolic activity	100	48	47	25	10	11
CeO_2NPs (μg/mL)	**0**	**5**	**10**	**25**	**50**	**100**
% of metabolic activity	100	76	68	60	57	46

Table S2. Impact of Aβ on the NPs uptake by microglia.

A

Sample	**CdTeQDs Fluorescence (arbitrary units)***
control	50 ± 7
Aβ	40 ± 1
CdTeQDs	2072 ± 105
Aβ + CdTeQDs	1936 ± 137

B

Sample	**SSC value (arbitrary units)***
control	37 ± 3
Aβ	35 ± 2
AgNPs	169 ± 18
Aβ + AgNPs	168 ± 19
CeO_2NPs	91 ± 11
Aβ + CeO_2NPs	86 ± 7

***** As measured by flow cytometry, BV-2 microglial cells were seeded into 6-well plates and grew overnight to reach 1.35 x 10^5 cells/well in average. The cells were incubated with Aβ (1−42) labelled with HiLyte™ Fluor 488 (AnaSpec Inc., Belgium) (0.1 μM), AgNPs (50 μg/mL), CeO_2NPs (100 μg/mL) or CdTeQDs (10 μg/mL) for 2 h. Subsequently, the cells were detached by trypsinization, spun down (200 x g, 4°C, 5 min), washed once with the culture medium containing 10% FBS, resuspended in the culture medium containing 2% FBS and analysed by flow cytometry (LSRFortessa, BD Biosciences). The AgNPs or CeO_2NPs uptake was assessed by change in a side scatter (SSC) value. The uptake of CdTeQDs was measured as an increase in fluorescence at 655 nm.

Table S3. Impact of NPs (AgNPs, 50 μg/mL; CeO_2NPs, 100 μg/mL; CdTeQDs, 10 μg/mL) on HiLyte Fluor 488-Aβ (0.1 μM) fluorescence in RPMI medium.

Sample	**Fluorescence (arbitrary units)***
RPMI medium	10394 ± 106
Aβ	38480 ± 414
AgNPs	9371 ± 361
CeO_2NPs	10318 ± 226
CdTeQDs	9929 ± 173
Aβ + AgNPs	40174 ± 535
Aβ + CeO_2NPs	44089 ± 833
Aβ + CdTeQDs	40380 ± 1234

* As measured by microplate fluorescence reader Infinite M200 (Tecan, Austria), set to excitation at 503 nm and emission 528 nm. The values are means ± SD. All solutions were prepared in RPMI medium without fetal bovine serum.

Table S4. Cell cycle distribution of BV-2 population after treatment with Aβ and/or NPs.

	Cell cycle phase, % of whole cells population			
Sample analysed	**G1 phase**	**S phase**	**G2 phase**	**Apoptosis/debris***
control	45.3 ± 2.2	50.0 ± 3.3	4.7 ± 1.7	0.3 ± 0.3
Aβ	46.5 ± 1.9	48.9 ± 3.5	4.5 ± 1.9	0.5 ± 0.7
CeO_2NPs	39.4 ± 1.7 [a]	55.6 ± 0.5 [a]	4.9 ± 1.6	0.9 ± 0.8
AgNPs	39.6 ± 2.4 [a]	58.8 ± 2.1 [a]	1.4 ± 0.2 [a]	25.2 ± 7.2 [a]
CdTeQDs	52.4 ± 1.2 [a]	42.5 ± 2.3 [a]	5.1 ± 1.2	12.8 ± 2.2 [a]
Aβ + CeO_2NPs	40.7 ± 0.6 [a]	53.9 ± 0.6 [a]	5.4 ± 0.7	0.8 ± 0.7
Aβ + AgNPs	37.3 ± 3.8 [a]	61.9 ± 3.8 [a]	0.7 ± 0.7 [a]	25.3 ± 5.6 [a]
Aβ + CdTeQDs	55.1 ± 3.1 [a]	40.3 ± 1.6 [a]	4.6 ± 1.6	16.0 ± 2.0 [a]

BV-2 cells were treated with 0.1 μM Aβ (1−42) and/or AgNPs (50 μg/mL), CdTeQDs (3 μg/mL), CeO_2NPs (100 μg/mL) for 48 h. The percentage of cells in respective cycle phase was calculated using ModFit LT v 5.0 Software (Verity Software House Inc., USA). Results are expressed as mean ± SD, n = 3, 'a' denotes statistically significant difference versus control group, $P < 0.05$, by t-test. The level of apoptosis/debris was indicated as % of whole cell population.