Electronic Supplementary Material (ESI) for Biomaterials Science.

Supporting Information

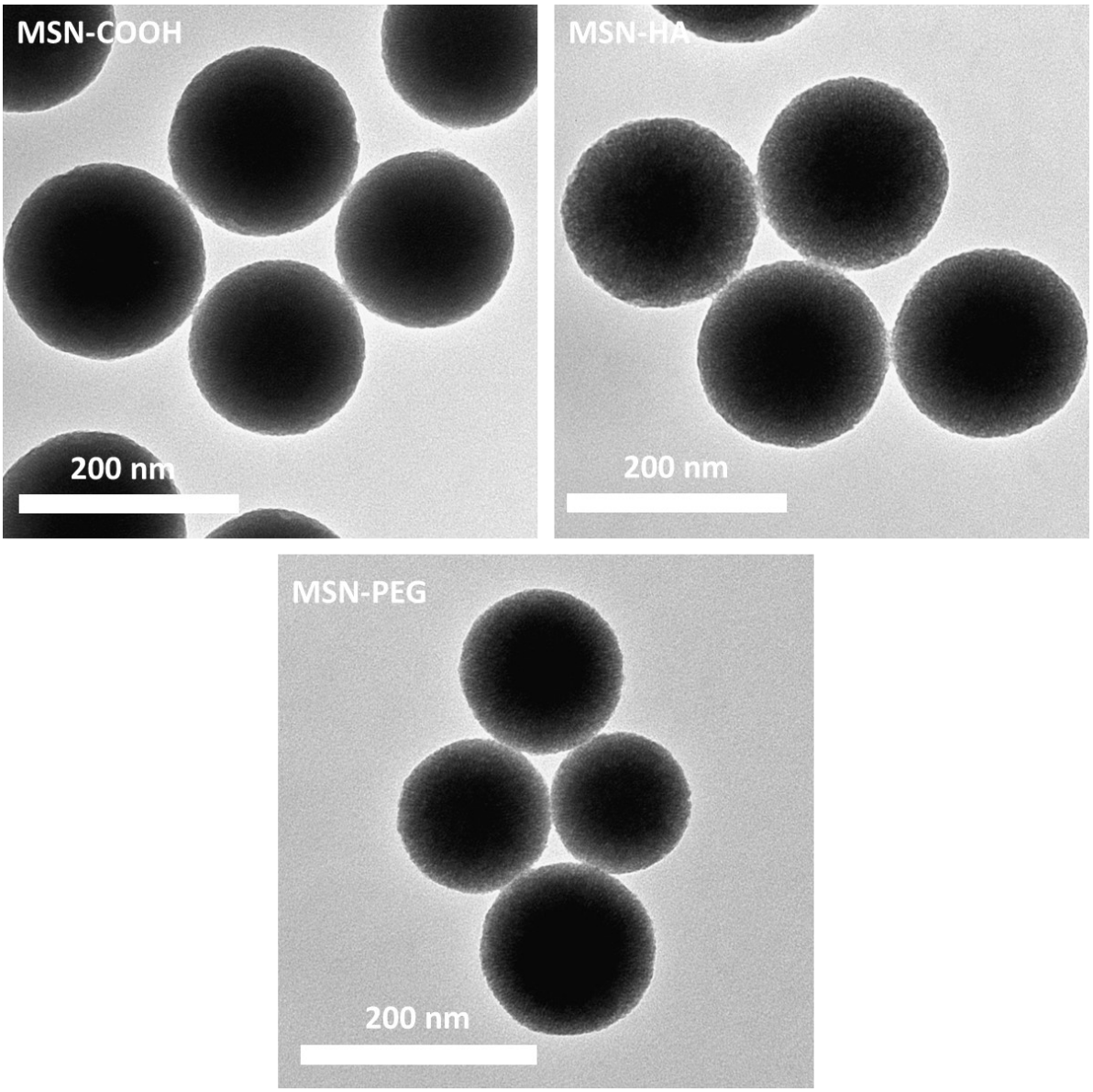

Figure S1. Exemplary transmission electron microscopy image of MSN-COOH, MSN-PEG and MSN-HA particles.

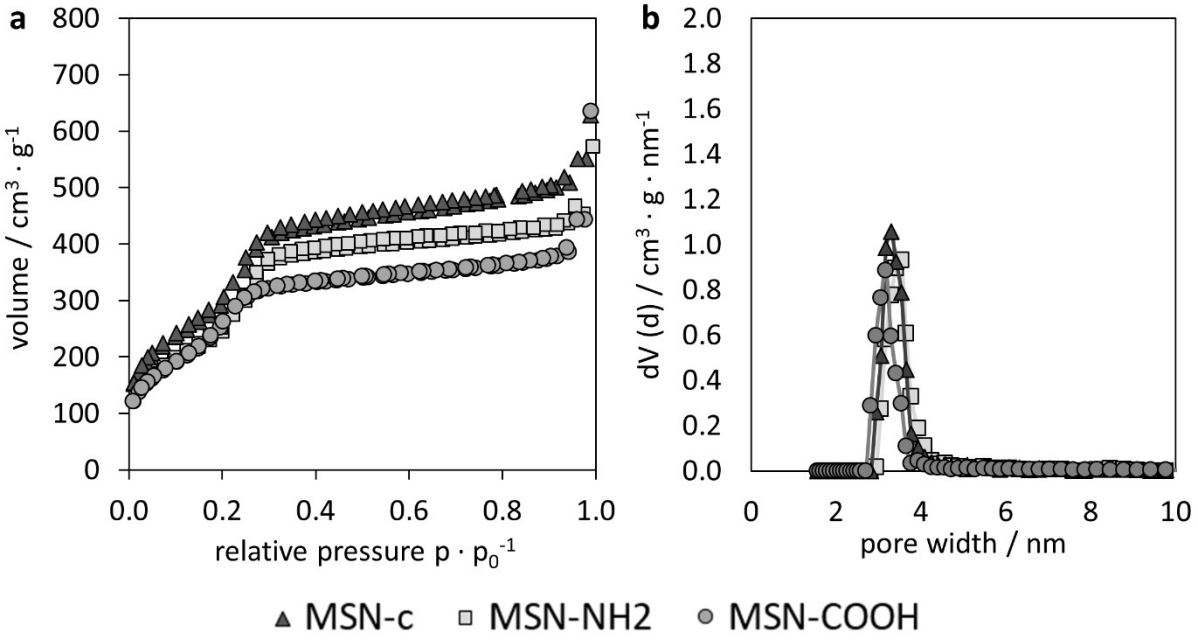

Figure S2. a) Nitrogen sorption isotherms of the basic particles MSN-NH_2, MSN-COOH and calcined MSN-c. b) Corresponding pore size distributions calculated using the equilibrium NLDFT kernel developed for silica.

Table S1. Data from the nitrogen sorption measurements of MSN-COOH, MSN-NH_2 and the basic calcined MSNc

	specific surface area / $m^2 \cdot g^{-1}$	**pore volume / $cm^3 \cdot g^{-1}$**	**pore diameter/ nm**
MSN-c	1048	0.74	3.3
MSN-NH_2	869	0.64	3.5
MSN-COOH	842	0.55	3.2

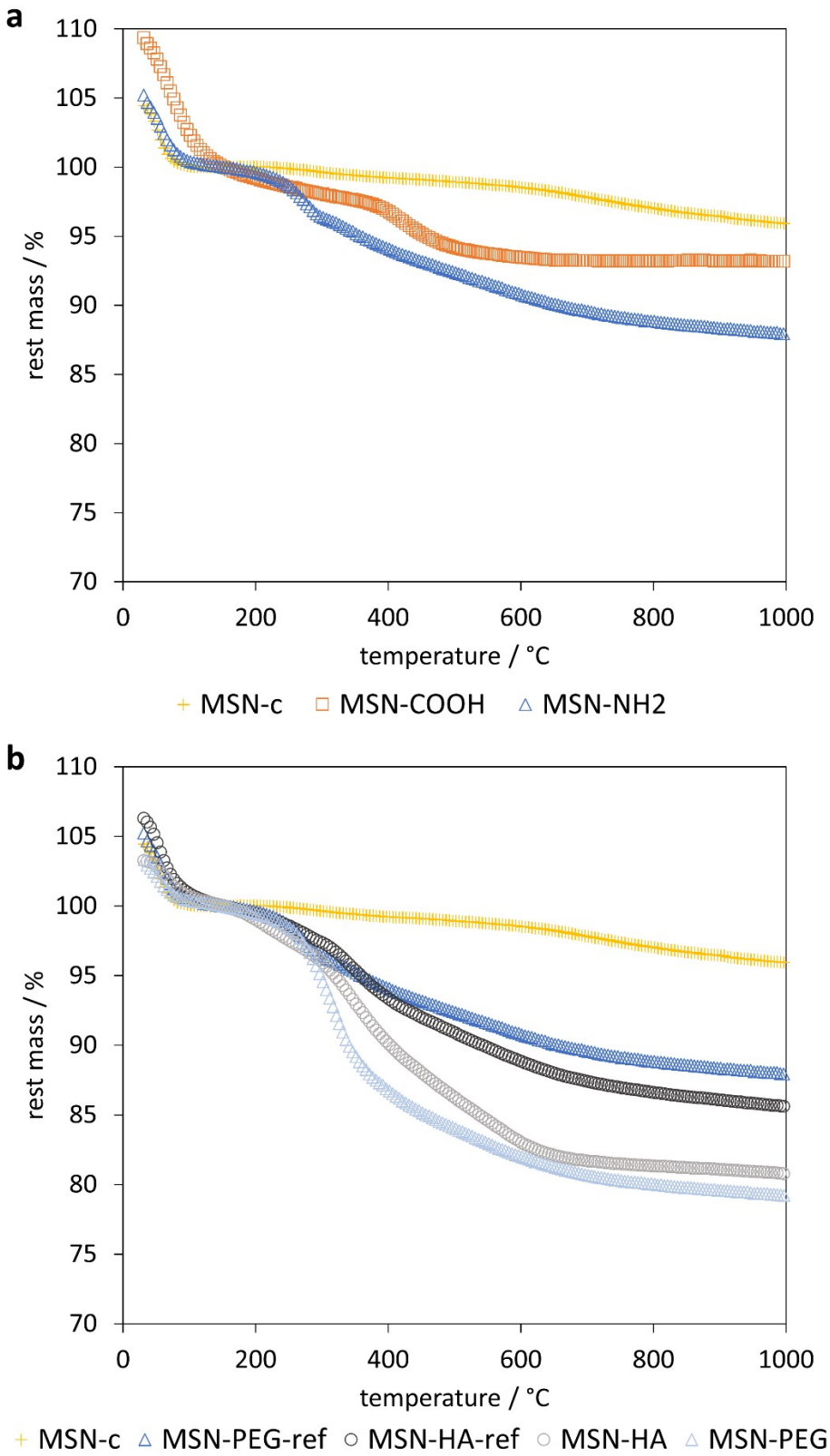

Figure S3. Exemplary thermogravimetric measurements of calcined MSN-c, MSN-COOH, MSN-NH2, MSN-HA and MSN-PEG. For the quantification of grafted polymer, the native particles were incubated in the respective solvent without HA or PEG to account for hydrolysis-related mass losses ('ref').

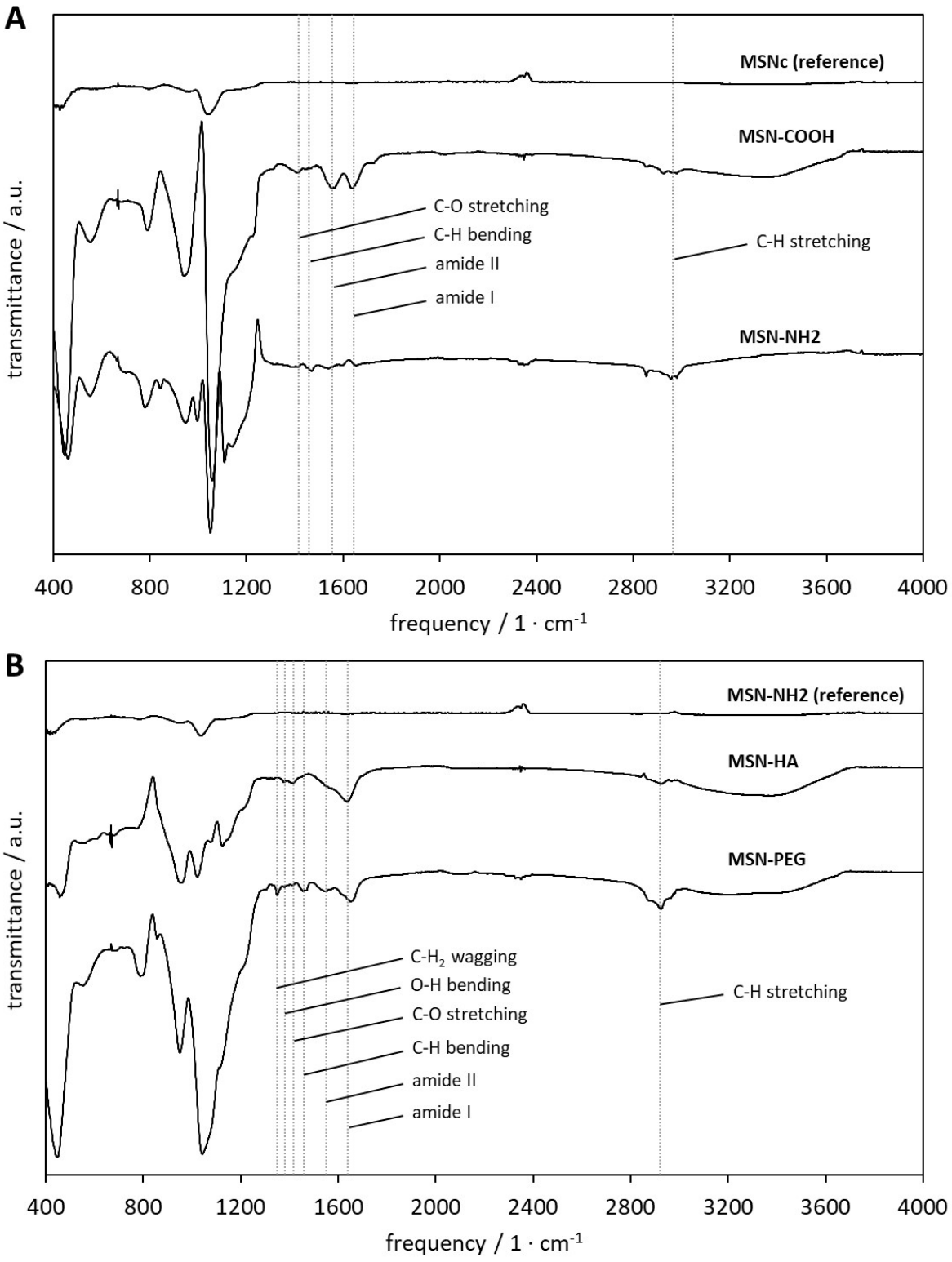

Figure S4. Exemplary ATR-IR spectroscopic analysis of different MSN types used in this study. A) IR spectra of MSN-COOH and MSN-NH2; IR spectrum of non-functionalized, calcined MSN-c particle was subtracted as background spectrum. B) IR spectra of MSN-HA and MSN-PEG; IR spectrum of the basic amino-functionalized MSN-NH2 particle was subtracted as background spectrum. Bands in the spectra of MSNs assignable to the various functional groups are highlighted in the figure (dashed lines). (doi.org/10.1002/bip.10245, doi.org/10.1016/0008-6215(94)00147-2, doi.org/10.3390/ijms13066639)

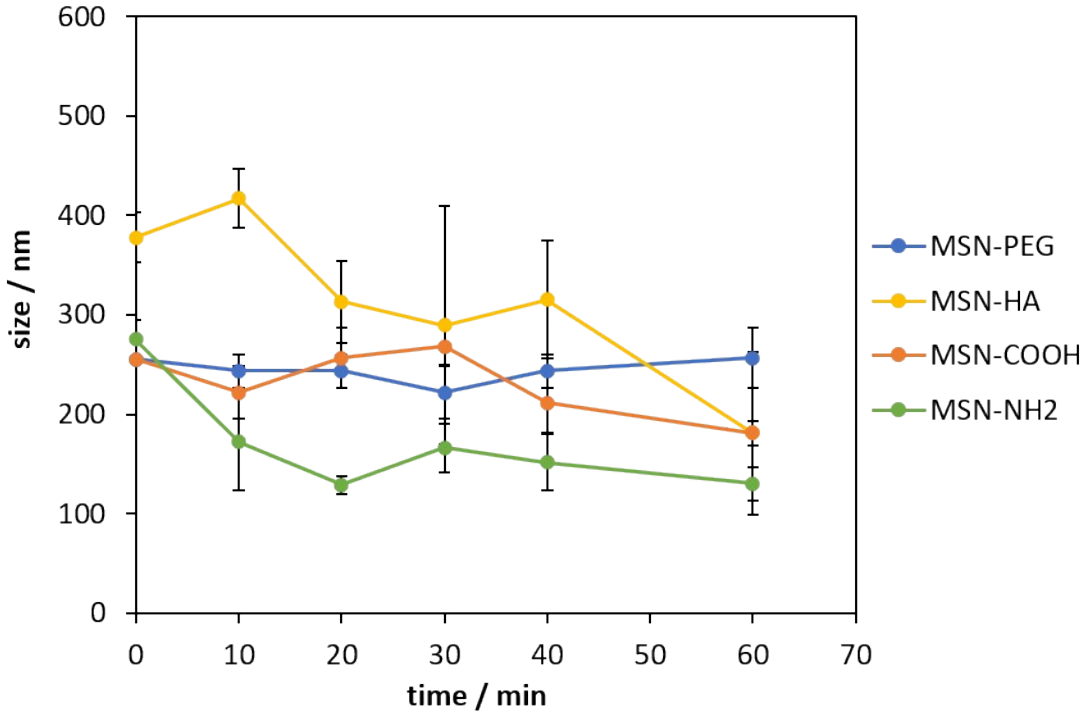

Figure S5. Mean hydrodynamic diameter measured by light-scattering as a function of incubation time in 10% FCS at a particle concentration of 10 μg/mL.

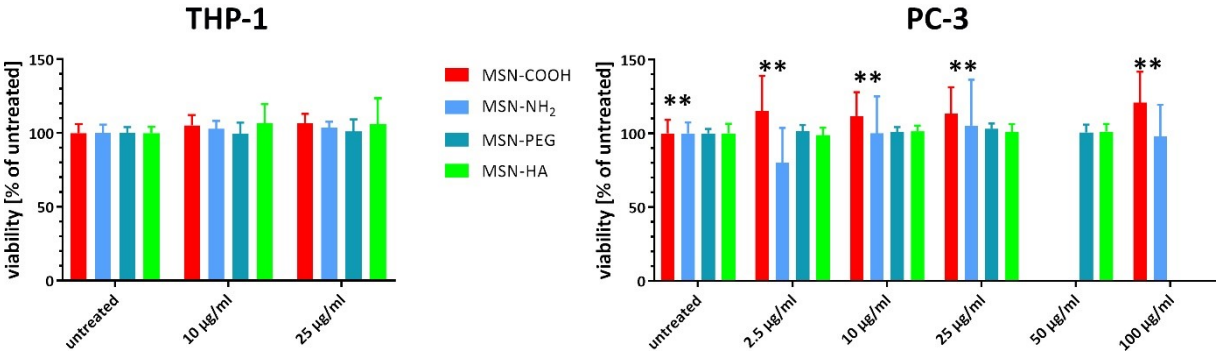

Figure S6. Cell populations were incubated with nanoparticles at indicated amounts for 24 h prior to cell viability testing using the Cell Titer Blue assay. The graph shows mean viability ± standard deviation (SD) as percentages of the untreated control, respectively. Three to four independent experiments were performed in triplicates (N = 9-12). Asterisks denote experiments which were carried out with parental, not genetically engineered PC-3 cells (please see methods section for details).

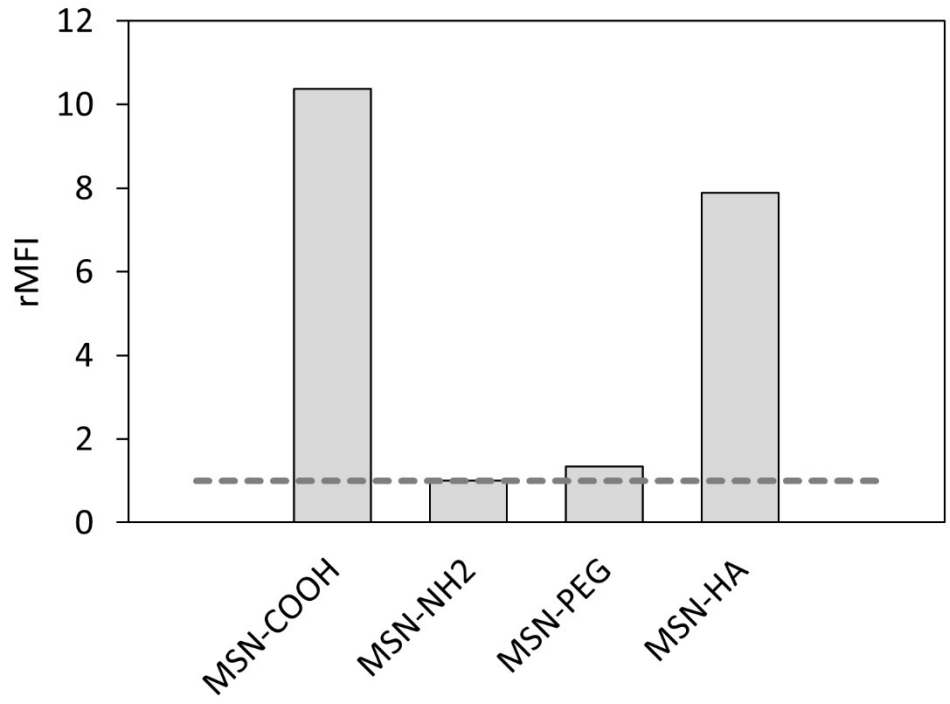

Figure S7. Mean fluorescence intensities (MFIs) of ATTO647N-labelled MSNs were measured in aqueous sucrose solution (10 %) at a particle concentration of 100 µg ml^{-1}. The respective MFIs were normalized on the MFI of MSN-NH_2 resulting in rated MFIs (rMFIs) to compensate for differences in particle fluorescence intensities. The dashed line indicates a rMFI of 1.

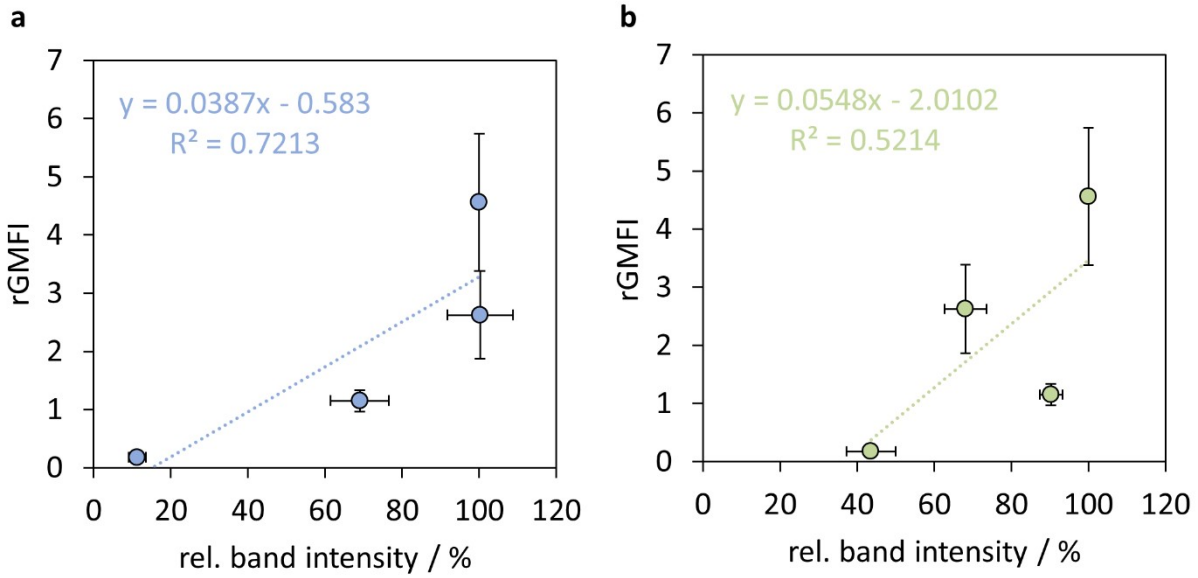

Figure S8. rGMFIs of THP-1 cells measured via flow cytometry after treatment with ATTO647-labelled MSNs at 10 µg mL^{-1} for 24 h and 37°C as a function of relative band intensity for the a) high molecular weight proteins and b) low molecular weight proteins (n = 3, error bars are SD).