Electronic Supplementary Material (ESI) for Nanoscale.


Supporting Information for

# Effect of Partial PEGylation on Particle Uptake by Macrophages

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## Contents

Supplementary Figures S1-S6

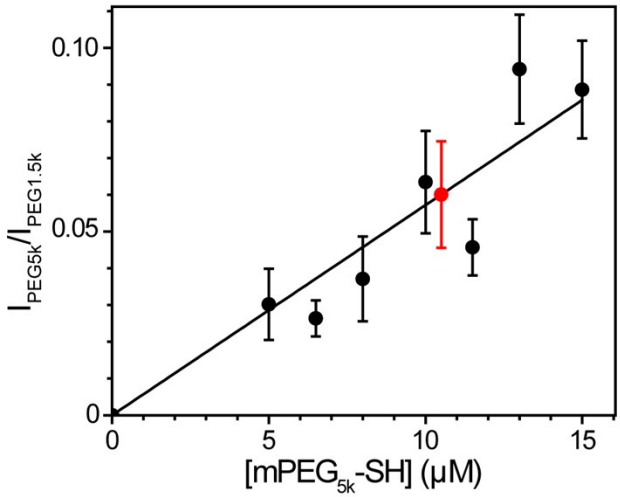


**Fig. S1** Calibration plot for MALDI-TOF MS measurements of mPEG$_{5k}$-SH concentration. $I_{PEG5k}$ and $I_{PEG1.5k}$ are the signal intensities for mPEG$_{5k}$-SH and the internal standard PEG$_{1.5k}$. Each data point for calibration (black dot) and for the cleaved PEG$_{5k}$ (red dot) is an average from 5 spectra, and the error bars represent the standard deviation. The calibration data are fit with a linear equation: $\frac{I_{PEG5k}}{I_{PEG1.5k}} = 5.72x10^{-3}\mu M^{-1}x\,[mPEG_{5k} - SH]$.

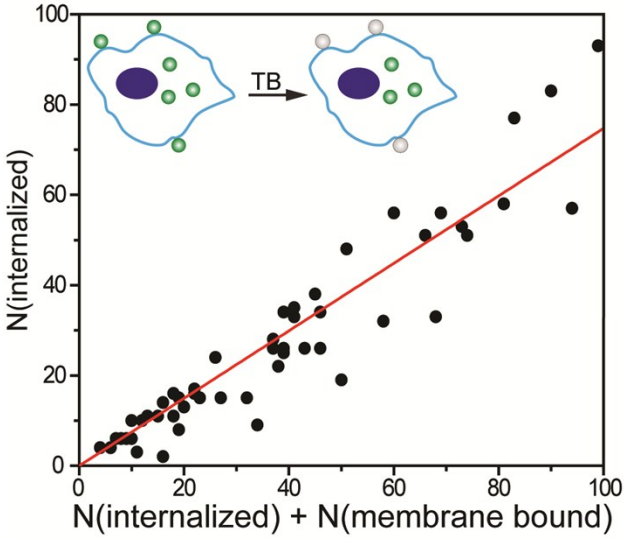


**Fig. S2** Quantification of internalization probability of particles using the trypan blue (TB) quenching method. The plot shows the results for 500 nm all-IgG particles in 6 independent samples. Each data point represents results from a single image containing multiple cells. Slope of the fitted line indicates the internalization probability.

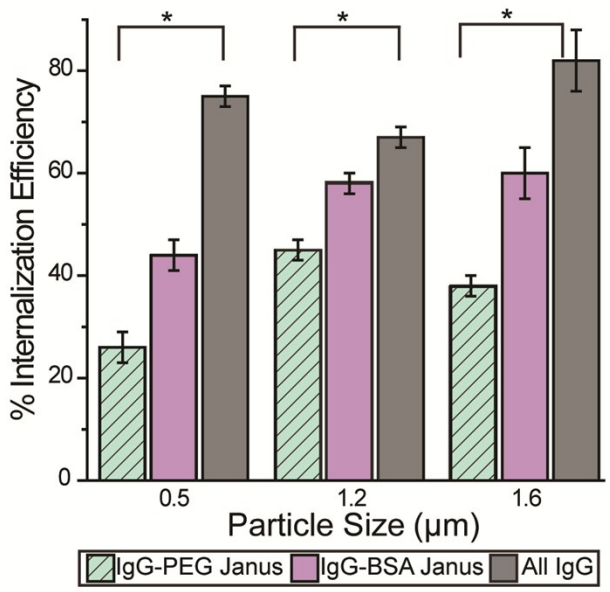


**Fig. S3** Internalization probability of three different types of particles as indicated. All particles included in this histogram were coated with IgG via streptavidin-biotin linkage. Non-specific adsorption of IgG was not used to generate the particles here because of the difficulty to create IgG-BSA Janus particles via non-specific adsorption without causing cross-contamination on the two sides. The asterisk (*) denotes a statistical difference between the labeled groups ($p < 0.05$). Results for each type of particles were obtained from 3-6 independent samples.

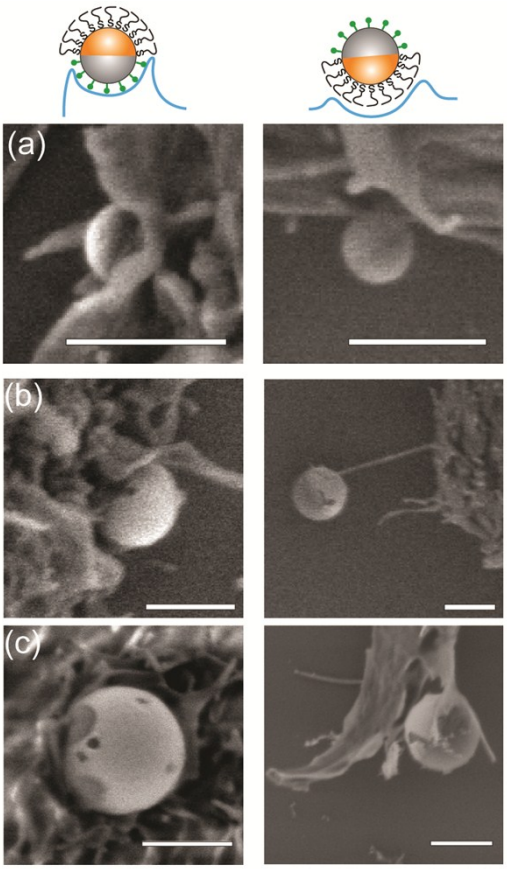


**Fig. S4** SEM images showing different membrane morphology on two sides of the IgG-PEG Janus particles of 500 nm (a), 1.2 μm (b) and 1.6 μm (c) in diameter. Particles oriented with the IgG coated side facing the cells are shown in the left column and ones with the PEGylated side facing the cells are shown in the right column. Scale bars: 1 μm.

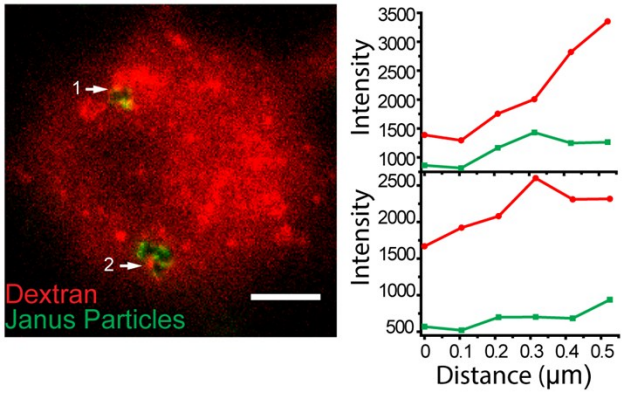


**Fig. S5** Colocalization of dextran, a fluid-phase maker for macropinocytosis, with 500 nm IgG-PEG Janus particles in phagosomes. Left: A fluorescence image showing the dextran (red) and Janus particles (green). Right: An intensity plot quantitatively showing the colocalization of dextran (red line) and Janus particles (green line). Scale bar: 5 μm.

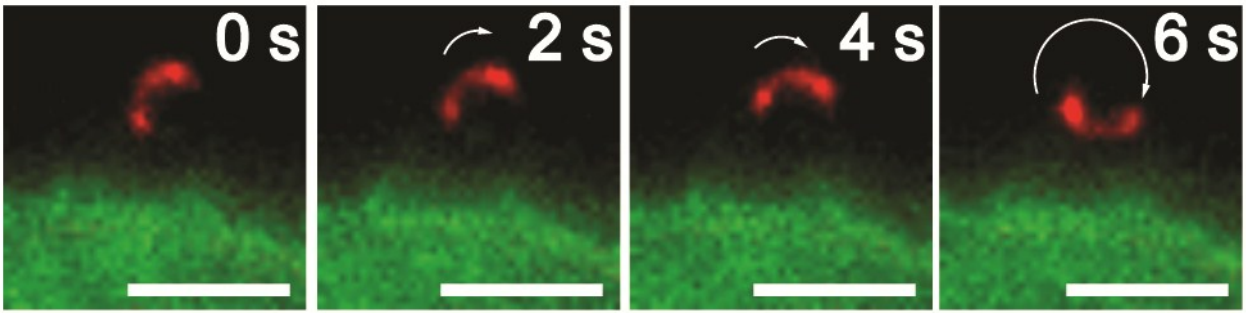


**Fig. S6** Fluorescence images showing the rotation of antiCD3-PEG Janus particles (shown in red) by a T cell (shown in green) upon particle-cell binding. The 1.6 μm Janus particles were functionalized with antiCD3 on the silica hemisphere and PEGylated on the gold hemisphere. The T cell rotated the particle until it bound the antiCD3 hemisphere.