Electronic Supplementary Material (ESI) for Soft Matter.

Janus Subcompartmentalized Microreactors

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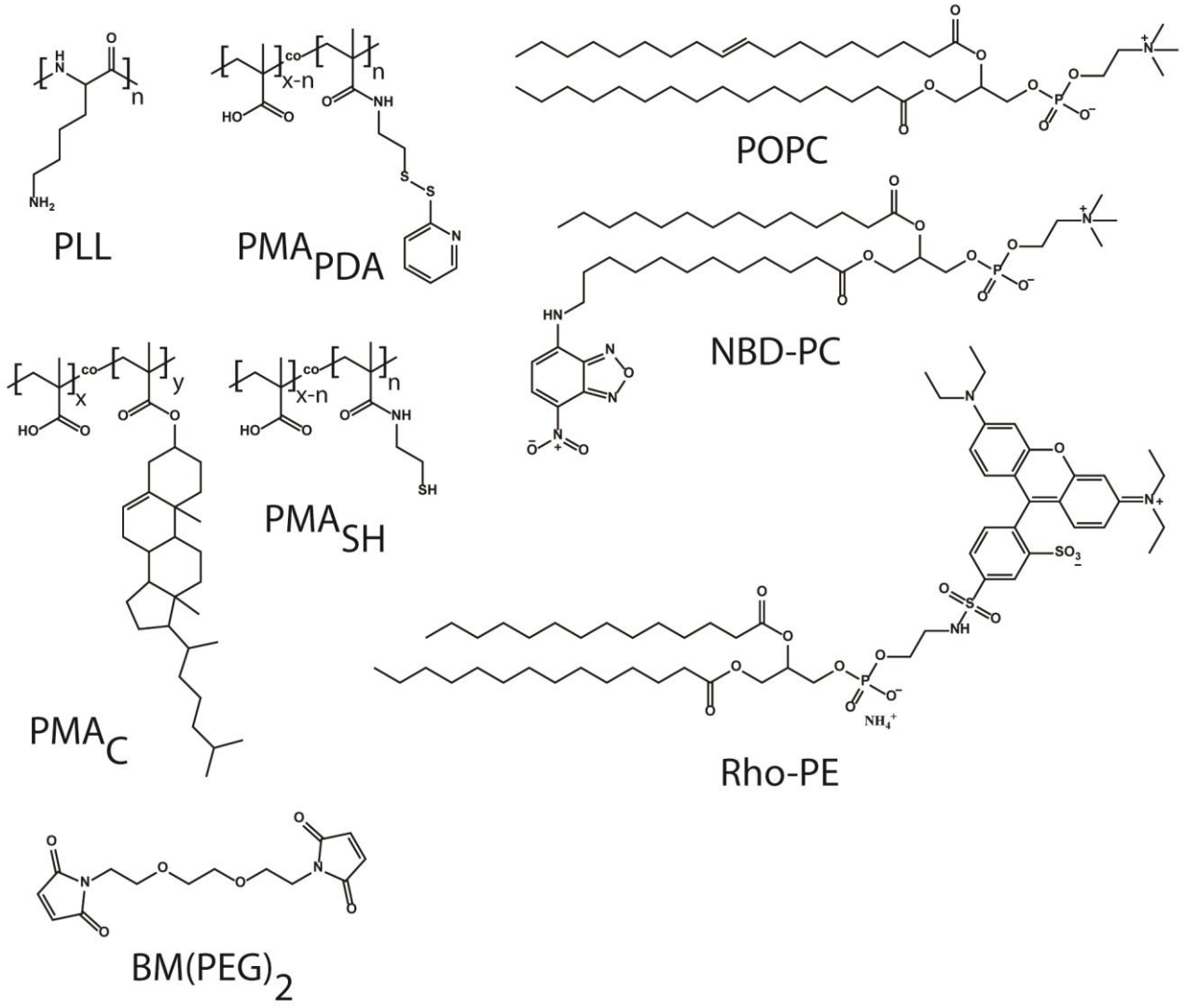

Fig. S1 Chemical structures of the most important compounds used in this report.

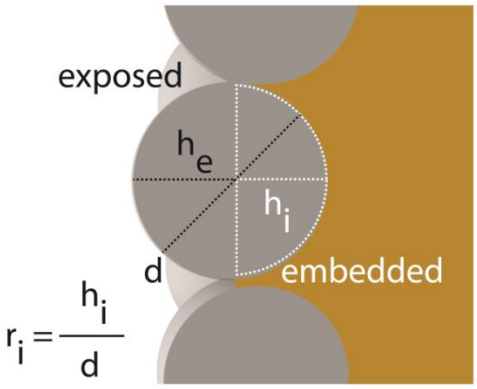

Fig. S2 The penetration depth of the silica particle into the wax, was estimated by a simplified geometric calculation: the diameter of the silica particle (d) was interrelated to the fraction of the particle exposed (h_e) and embedded (h_i) into the wax.

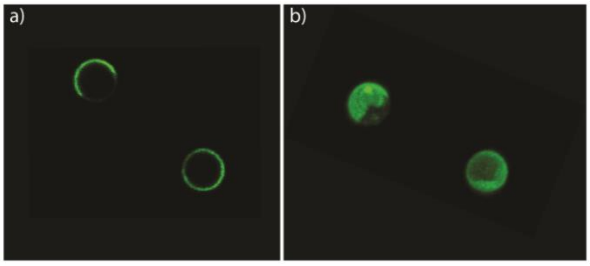

Fig. S3 CLSM images demonstrating the difference of 2D and 3D (or z-stacked) images. In a) the right particle suggested a complete coverage. b) The screening through different planes of this particle revealed the existence of the non-fluorescent patch.

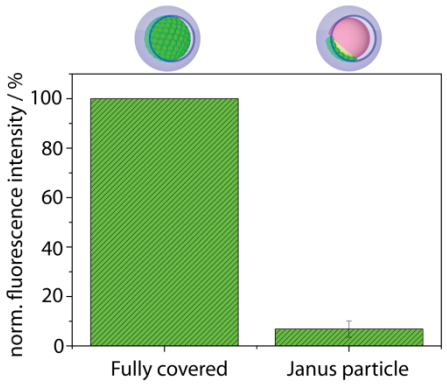

Fig. S4 Normalized fluorescence of silica particles fully covered with L_g and Janus particle covered with L_g on one hemisphere.

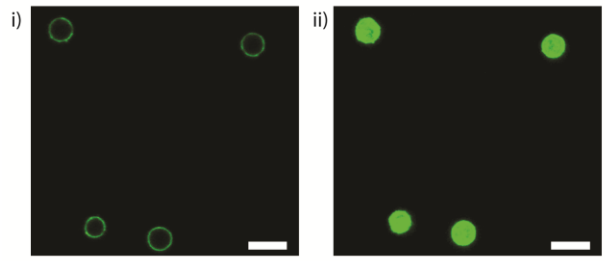

Fig. S5 PLL coated silica particles after the deposition of NBD-labeled liposomes and one further layer of $PMA_{C.}$ i) CLSM image and ii) the corresponding z-stack image of these particles. The scale bars are 5 µm.

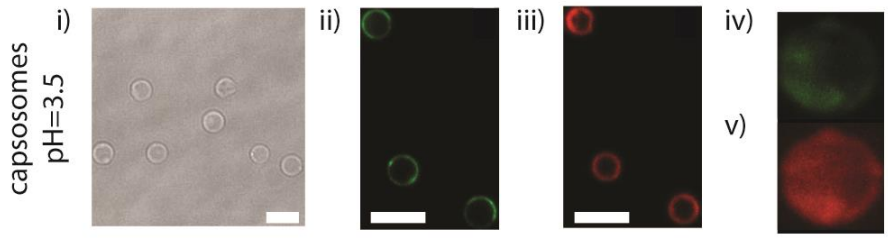

Fig. S6 Janus capsosomes at pH 3.5: i) Bright field image of Janus capsosomes after removal of the silica core. 2D CLSM images visualizing L_g (ii) and the enclosing AF633-labeled hydrogel shell (iii). Z-stacked images of one exemplary capsosome visualizing L_g (iv) and the enclosing AF633-labeled hydrogel shell (v).

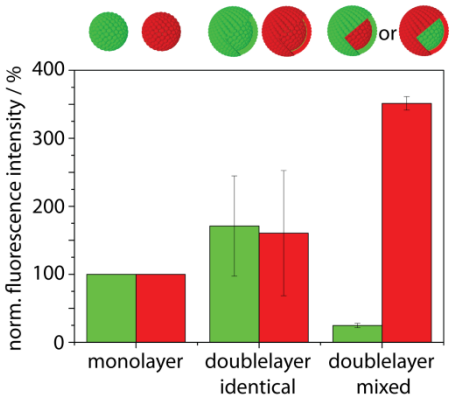

Fig. S7 Normalized fluorescence intensity of the PLL pre-coated particles upon adsorption of NBD-labeled liposomes (L_g) or RhoB-labeled (L_r) liposomes measured by flow cytometry. The fluorescent intensity (Fl-1 channel is depicted by green bars, Fl-2 channel is depicted by red bars) monitored after the first liposome deposition step was put to 100% and the subsequent values were normalized to these values (left columns). The deposition of an additional layer of the same set of liposomes used for the first layer to PLL/$L_{g\ or\ r}$/PLL pre-coated particles (i.e., L_g to PLL/L_g/PLL or L_r to PLL/L_r/PLL) showed the expected results of nearly doubling the measured fluorescent intensities (middle columns). On the other hand, the deposition of L_g and L_r to PLL/$L_{r\ or\ g}$/PLL pre-coated particles, yielded mixed double layer assemblies, which led to an decrease in the Fl-1 channel and increase in the Fl-2, respectively (right columns). This result was expected due to unfavorable cross talk between the two fluorescent channels in the flow cytometer. While through the Fl-1 filter (533 +/- 30 nm) the fluorescence of the NBD dye was detected, a significant contribution of the NBD emission was recognized through the Fl-2 filter (585 +/- 40 nm) as well. In addition, the emission and absorption spectra of NBD and RhoB, respectively, exhibited a spectral overlap, yielding in a significant decrease of the fluorescence of the green channel, after deposition of L_r. As a consequence, the evaluation regarding L_r coverage of the hierarchical organized capsosomes could not be quantified satisfactory.

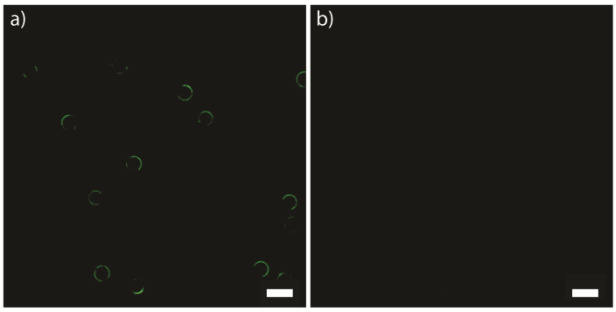

Fig. S8 CLSM image of Janus core-shell particles containing L_g, visualized in the green (a) and red (b) channel, demonstrating that the green (NBD) fluorescence was not observed in the red channel with the used settings for imaging.

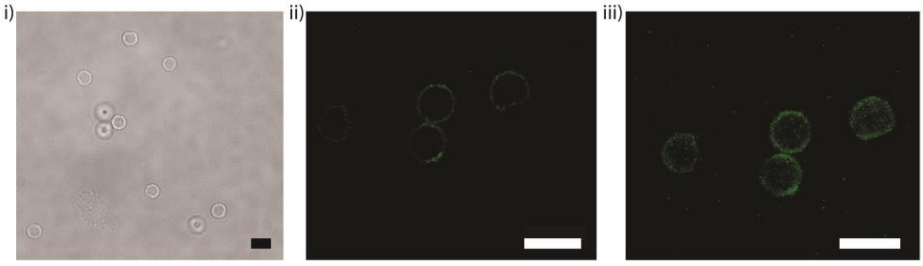

Fig. S9 Bright filed image of (PVP-PLL/L_T/PMA_c/(PVP/PMA_{SH})$_3$ Janus microreactors with removed core (i) and the corresponding CLSM image (ii) and z-stack image (ii) after incubation with the substrate BA-Rho-110. Scale bars are 5 µm.

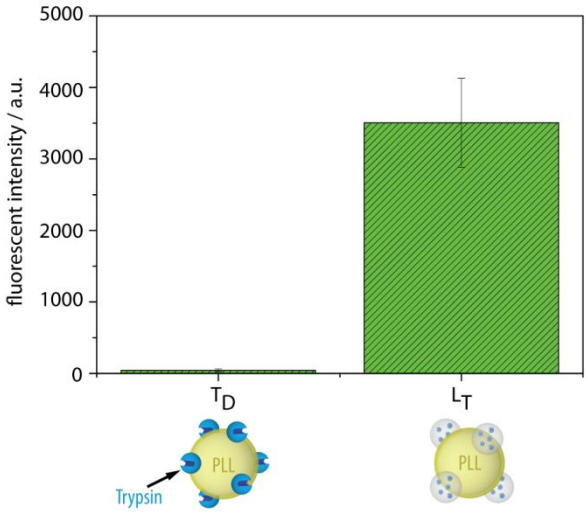

Fig. S10 Fluorescent intensity of the supernatant of a solution with either PLL/T_D or PLL/L_T coated silica particles after incubation with the substrate BA-Rho-110 for 30 min.