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Supporting Information

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Engineering, Characterization and Directional Self-Assembly of Anisotropically Modified Nanocolloids

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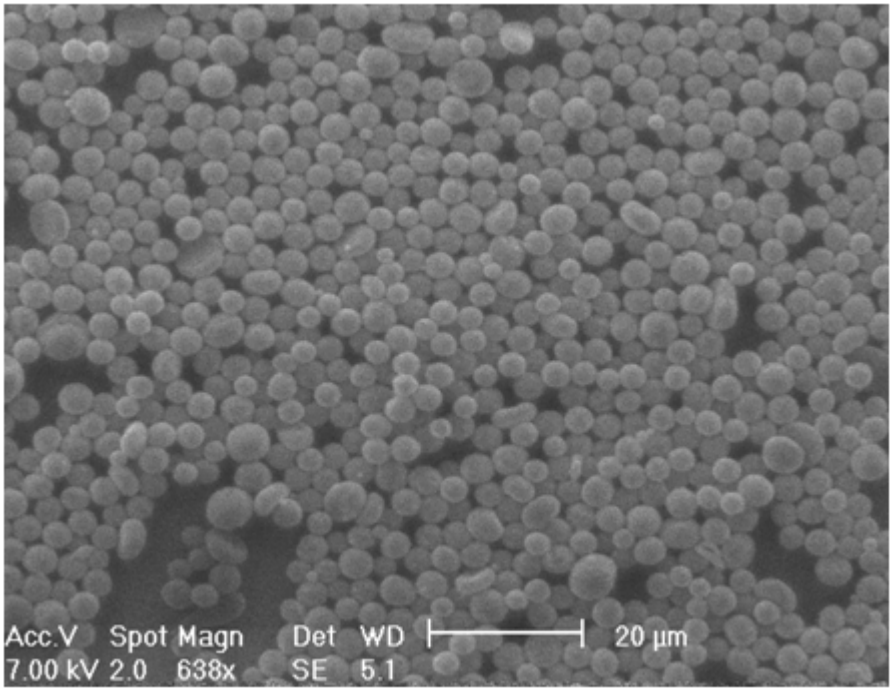

Figure S1. SEM image of tricompartmental particles.

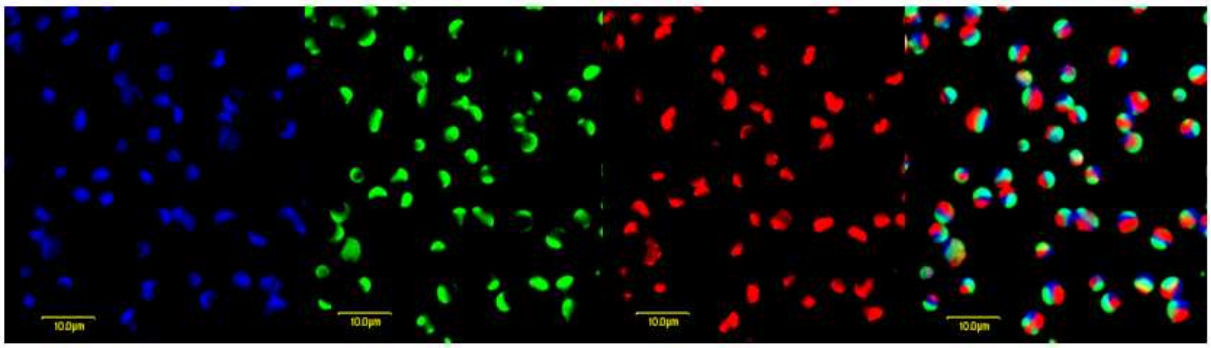

Figure S2. CLSM image depicting a large population of tricompartmental microparticles showing diverse internal architectures. Blue, green and red channels resulting from ADS406PT, PTDPV, and ADS306PT respectively are shown, followed by their overlay.

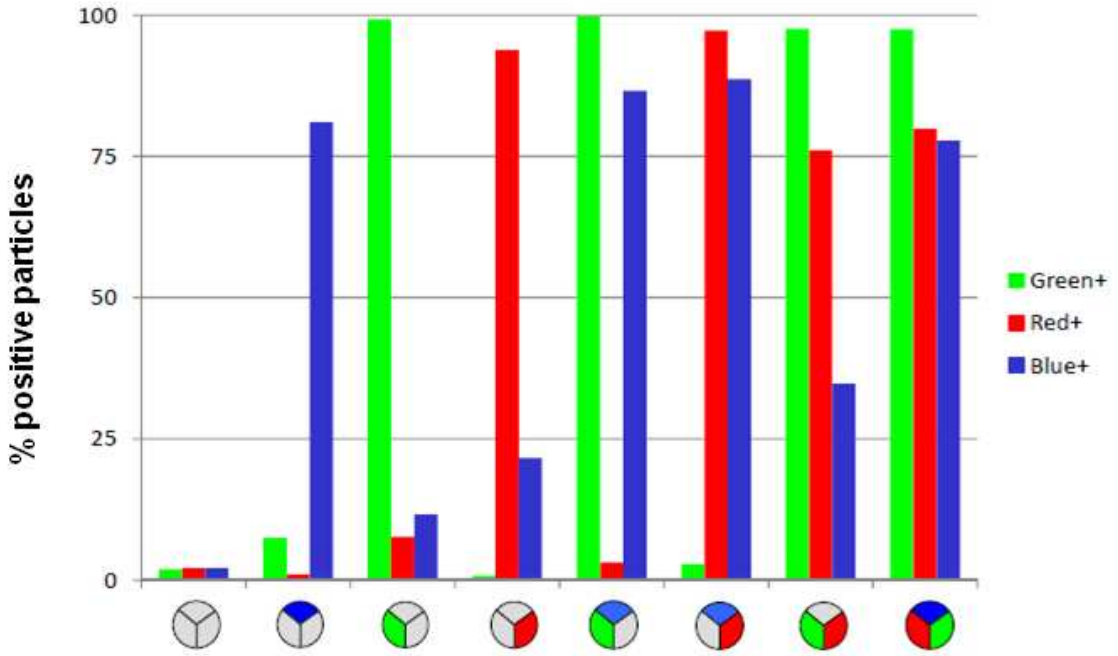

Figure S3. Histograms depicting quantification of degree of blue (ADS406PT), green (PTDPV), and red (ADS306PT) fluorescence signals from tricompartmental particles with different permutations of dyes. The y-axis denotes the percentage of particles, which showed positive fluorescence signal (greater than background fluorescence) for a given dye (indicated by blue, green and red bars) for a population of particles containing a given combination of dyes (indicated by a schematic on the x-axis). The sample size is 10,000 particles. Particles containing a single dye show an increase in fluorescence intensity for the corresponding dye. Similarly, particles containing two dyes show an enhancement of fluorescence signal corresponding to both dyes. Finally, tricompartmental particles containing all the three dyes exhibit an increase in fluorescence intensity in all the three channels.

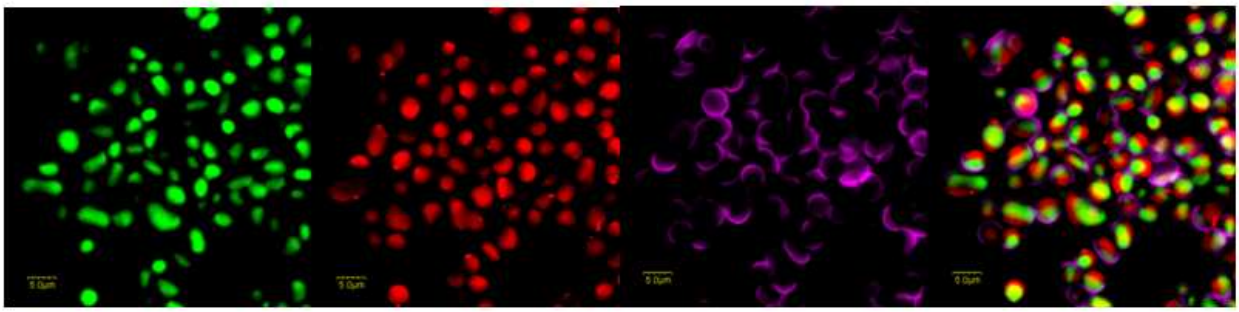

Figure S4. CLSM image showing a large population of bicompartmental particles containing green and red dyes, loaded with PLA-co-PPGL in the green compartment and selectively surface modified with biotin on this compartment only, as shown by the fluorescence of Alexa Fluor 633-labeled streptavidin (indicated in magenta).

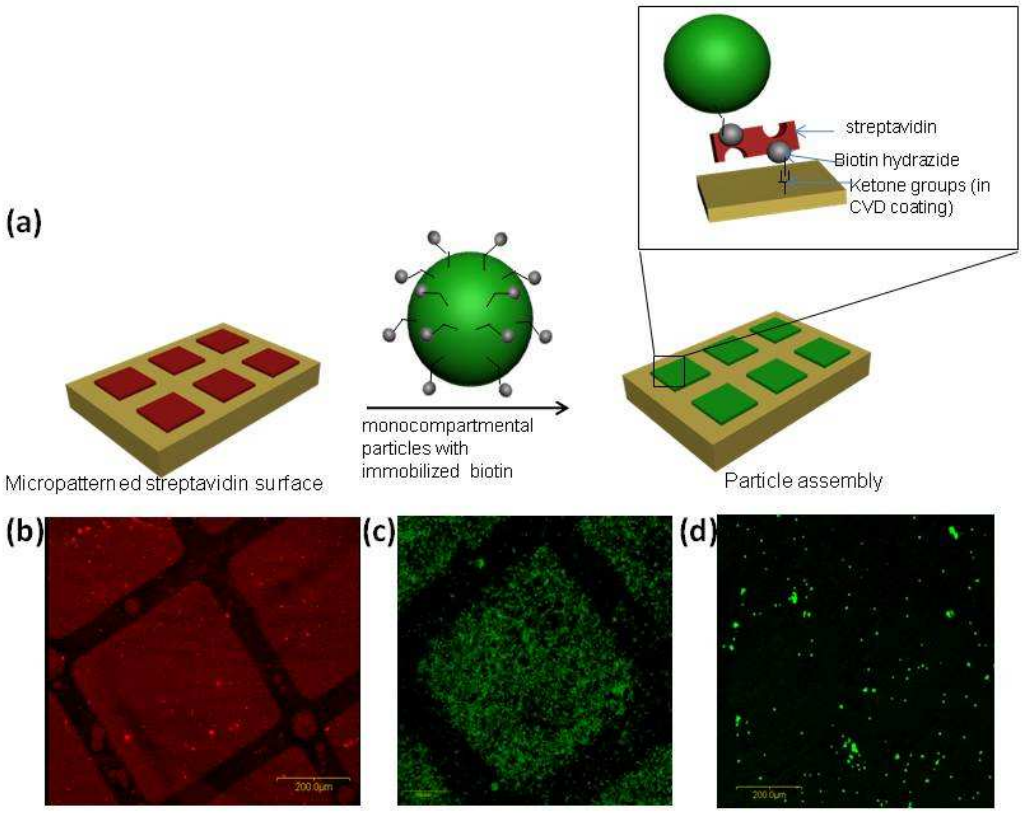

Figure S5. (a) Schematic depicting proof of concept of self assembly of particles on CVD substrates. Monocompartmental particles containing acetylene groups were first surface modified with biotin via click chemistry. To prepare streptavidin presenting surfaces, poly[(4-formyl-p-xylylene)-co-(p-xylylene)] was first deposited on silica substrates via CVD

polymerization of 4-formyl[2,2]paracyclophane. The aldehyde groups in the CVD coating were microcontact printed with biotin hydrazide, followed by incubation of Alexa Fluor 633 streptavidin. The biotin-functionalized particles were then incubated with these surfaces. (b) CLSM image of CVD substrates immobilized with Alexa Fluor 633-labeled streptavidin. The selective red fluorescence indicates successful patterning of substrates with streptavidin. (c) CLSM image of particles incubated with streptavidin presenting CVD substrates. (d) control substrates incubated with particles without any surface biotin groups. These surfaces are mostly devoid of particles, indicating negligible non-specific binding.

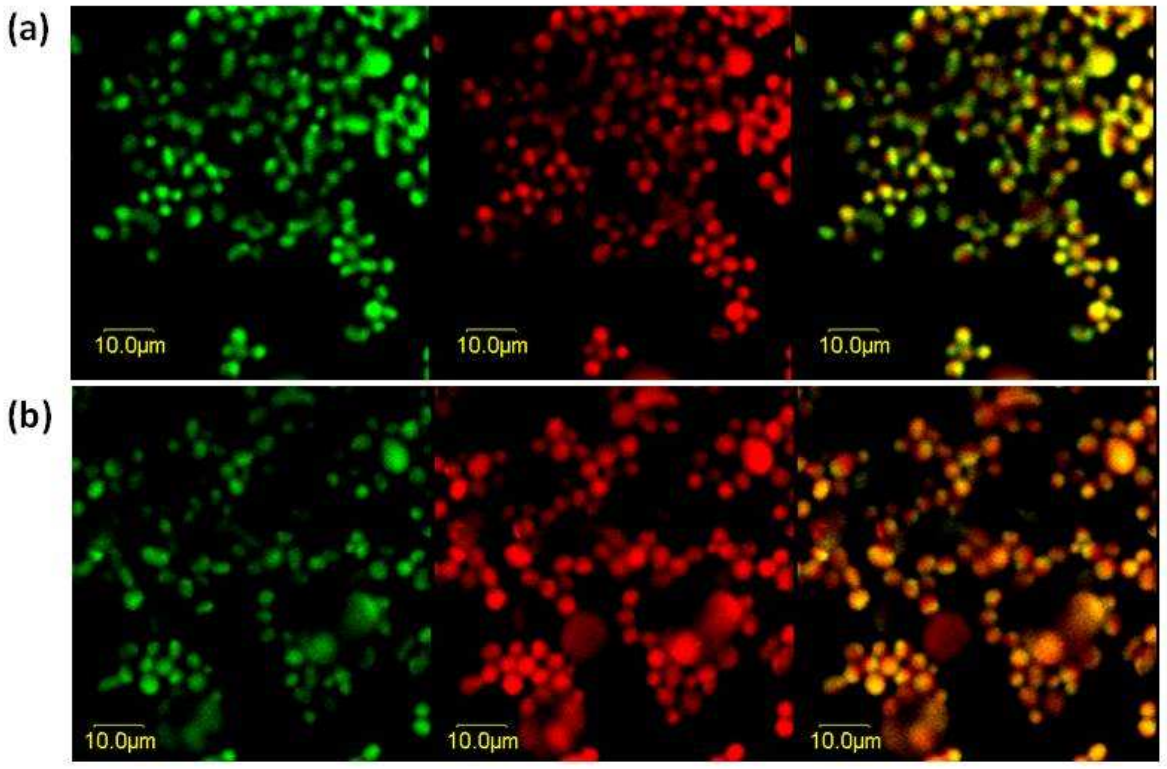

Figure S6. (a) CLSM image showing a random orientation of bicompartmental particles containing biotin in one compartment only on streptavidin presenting CVD substrates. (b) oriented particles, imaged at same fluorescent intensity levels at the same magnification, indicating that observation of orientation was not biased by changes in fluorescence intensity levels.