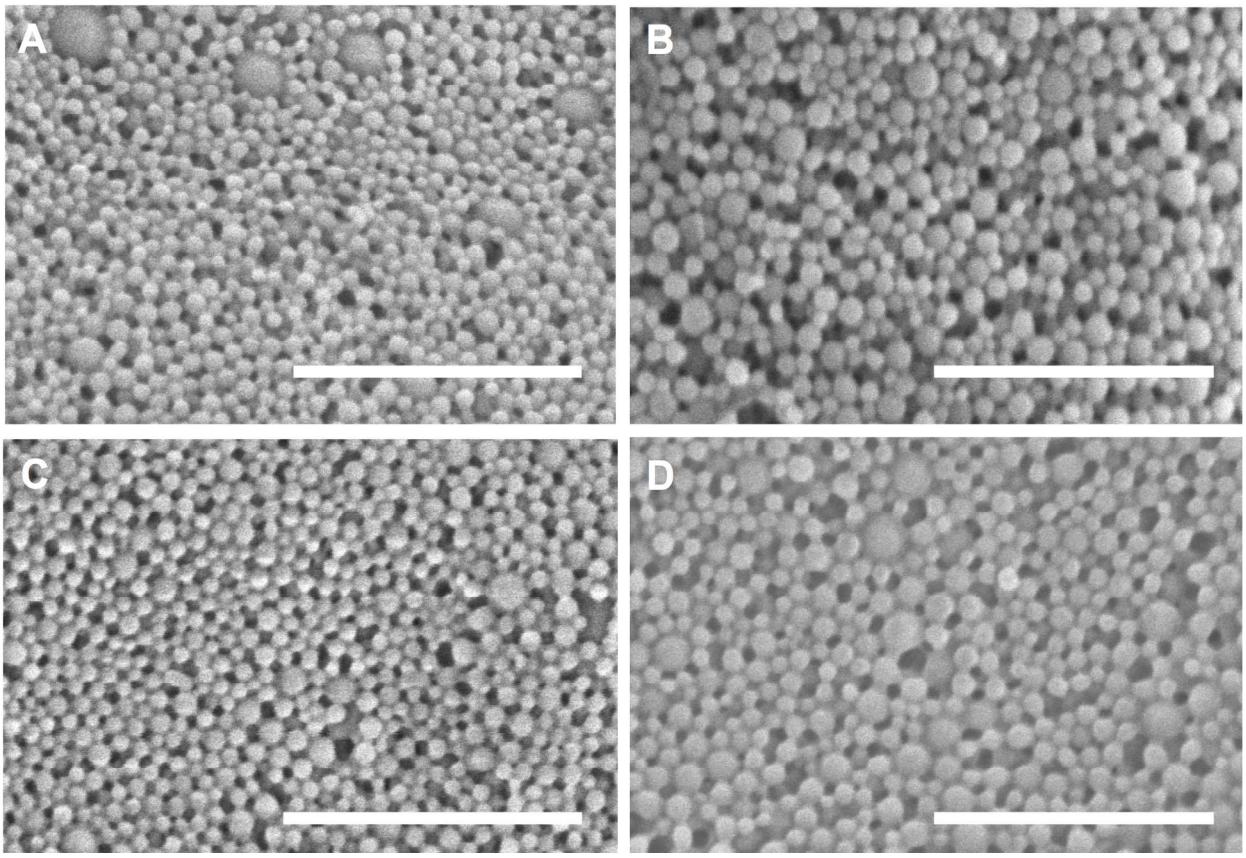
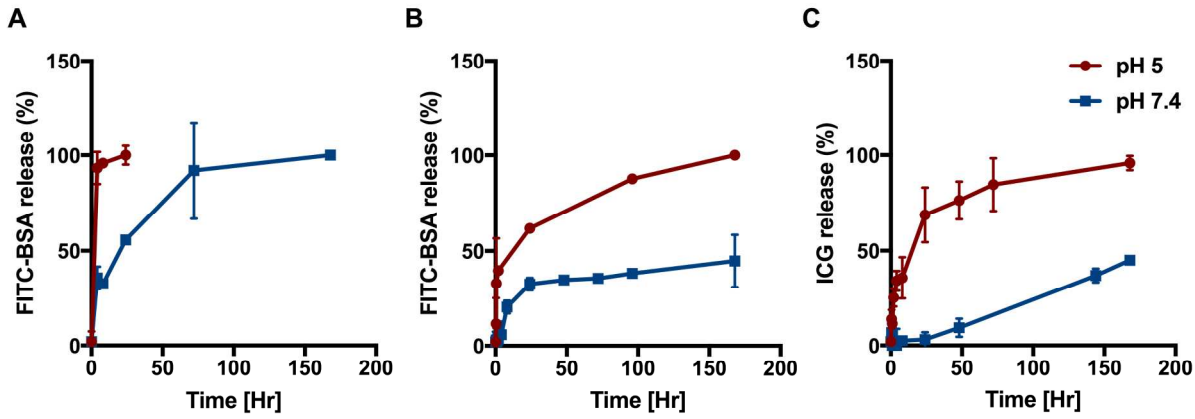
**Supplemental Table 1. Characterization of fluorophore-encapsulated acetalated dextran microparticles.** Hydrodynamic size and encapsulation efficiency of Ace-DEX MPs encapsulating various fluorophores using either Texas Red-conjugated dextran (TR/Ace-DEX) or native dextran with various relative cyclic acetal coverages (CAC). Data are presented as mean ± standard deviation (n=3).

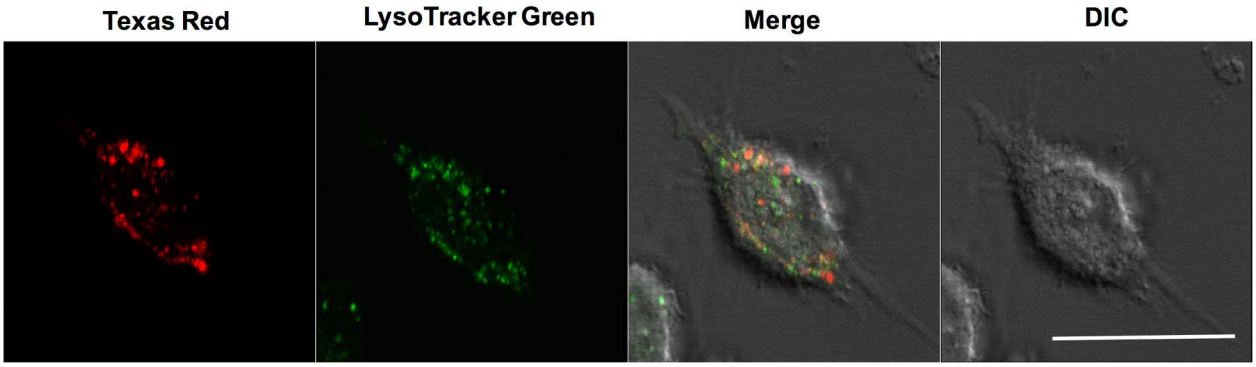
| Formulation | Relative CAC (%) | Cargo | Hydrodynamic Size (nm) | Weight Loading (% w/w) | Encapsulation Efficiency (%) |
|---|---|---|---|---|---|
| **TR/Ace-DEX MPs** | 26% | Blank | 209 ± 23 | - | - |
| **Native Dextran Ace-DEX MPs** | 26% | Blank | 419 ± 47 | - | - |
| | 55% | Blank | 196 ± 12 | - | - |
| | 26% | FITC-BSA | 495 ± 84 | 1 | 89.7 ± 2.3 |
| | 55% | FITC-BSA | 546 ± 56 | 1 | 87.7 ± 1.1 |
| | 55% | ICG | 422 ± 72 | 1.3 | 68.2 ± 6.7 |




**Supplemental Figure 1. Scanning electron microscopy images of Ace-DEX MPs.** Scanning electron micrographs of Ace-DEX MPs composed of (A) Texas Red-conjugated Ace-DEX (TR/MP), native polymer with (B) 26% CAC or (C) 55% CAC encapsulating fluorescein-bovine serum albumin (FITC-BSA/MP), or (D) indocyanine green (ICG/MP). Representative image of three independent experiments. Scale bar is 1 μm.




**Supplemental Figure 2. Drug release kinetics of Ace-DEX MPs encapsulating FITC-BSA or ICG.** *In vitro* drug release performed at pH 5 and pH 7.4 of (A) 26% CAC FITC-BSA/MPs, (B) 55% CAC FITC-BSA/MPs, or (C) ICG/MPs. Values are reported as mean percent release normalized to the zero time point ± SEM.




**Supplemental Figure 3. Confocal microscopic analysis 5h post-exposure to Texas Red/Ace-DEX MPs.** Ace-DEX MPs composed of Texas Red-conjugated Ace-DEX were delivered to bone marrow-derived macrophages for 5 hours, followed by live cell imaging using laser scanning confocal microscopy (40x oil immersion). Red: Texas Red microparticles, green: LysoTracker Green dye. Representative image of three independent experiments. Scale bar is 10 μm.