Mucopenetrating Micelles with a PEG Corona

Essi M. Taipaleenmäki,^a Sidsel A. Mouritzen,^a Philipp S. Schattling,^a Yang Zhang,^a Brigitte Städler^{*, a}

^a Aarhus University, Interdisciplinary Nanoscience Center (iNANO), 8000, Denmark



Figure S1. NMR-spectrum of PEG_b-PCMA block copolymer.



Figure S2. NMR-spectrum of PEG-PCMA block copolymer.



Figure S3. NMR-spectrum of PEG-PCL block copolymer.



Figure S4. Emission spectrum of NR at varying polymer concentrations (0.1-1 mg mL⁻¹) for P2 (a), P4 (b), and P6 (c). The data is presented as mean (n = 2) (for P4 1 mg mL⁻¹ n = 1).



Figure S5. Representative TEM-images of NR or FC loaded micelles prepared by using P2, P4 and P6. 1 mg mL⁻¹ (P2, P4 FC) and 5 mg mL⁻¹ (P4 NR, P6) polymer concentrations were used for micelle assembly.

Polymer	Cargo	Polymer concentration	Minor axis [nm]	Major axis [nm]	Aspect ratio	Hydrodynamic Radius [nm]
P2	NR	5 mg/ml	18 ± 3	29 ± 10	1.6	140 ± 62
P4	NR	5 mg/ml	15 ± 3	21 ± 5	1.5	92 ± 33
P6	NR	5 mg/ml	94 ± 26	123 ± 33	1.3	115 ± 18
P4	FC	1 mg/ml	15 ± 3	23 ± 7	1.6	116 ± 33

Table S1. Size of FC or NR loaded micelles prepared by using block copolymers P2, P4 and P6.



Figure S6. a) Quantification of double-stranded DNA in Caco-2/TH29-MTX-E12 co-culture over time. The data are expressed as mean \pm SD, n = 2. b) The results of cell viability assay by using non-diluted cell counting kit solution (black) and 4× diluted solution (red). Absorbance value corresponds to the amount of formazan dye generated by dehydrogenases in living cells. The data are expressed as mean \pm SD, n = 5 (D5 non-diluted), n = 4 (D5 diluted, D7), n = 3 (D2, D12, D18, D21 diluted), n = 2 (D21 non-diluted).



Figure S7. a) Alcian blue –staining of mucus in Caco-2/HT29-MTX-E12 co-cultures at different cultivation days. b) Trans-epithelial electrical resistance (TEER) of Caco-2 monoculture (black), Caco-2/HT29-MTX-E12 co-culture (red) and HT29-MTX-E12 monoculture (blue) at different cultivation days. Seeding density for all cultures was 120 000 cells/well. The data are expressed as mean \pm SD, n = 2.



Figure S8. Schematic illustration (i) and representative CLSM images showing Caco-2/HT29-MTX-E12 co-cultures incubated for 10 min (ii) and 1 h (iii) with FC (green). Blue: nuclei stained with H33342. Scale bars are 40 µm.



Figure S9. Schematic illustration (i) and representative CLSM images showing Caco-2/HT29-MTX-E12 co-cultures incubated for 1 h (ii) and 3 h (iii) with NR-loaded micelles assembled from P2 (a), P4 (b) and P6 (c). Blue: nuclei stained with H33342, red: NR, green: P6_F, yellow: co-localization of NR and P6_F. Scale bars are 40 μ m.