Supplementary Information

Figures

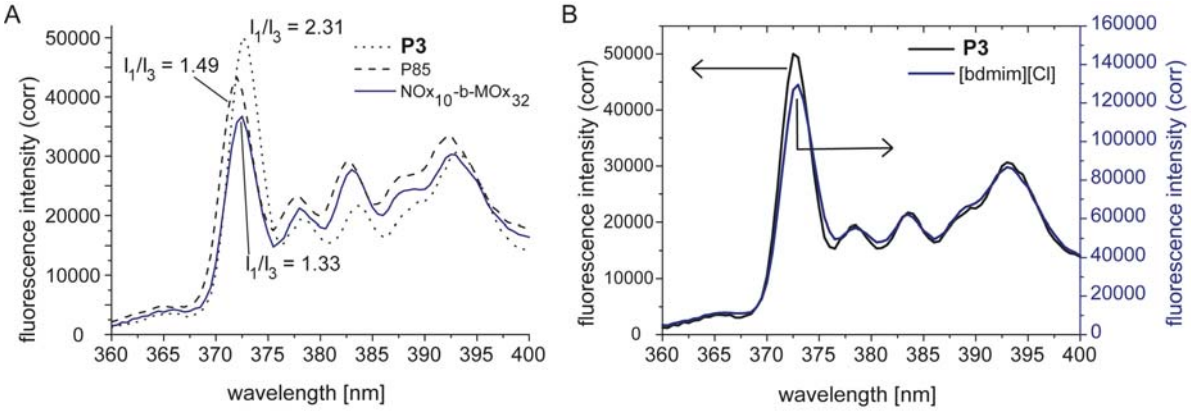


Fig. S1. A) Pyrene fluorescence spectra recorded at room temperature in aqueous solutions of 2-nonyl-2-oxazoline based block copolymer P[NOx_{10}-b-$MeOx_{32}$] (2.1×10^{-4} M) [1], Pluronic P85 (2.2×10^{-3} M) and the 2-butyl-2-oxazoline based $MeOx_{36}$-b-$BuOx_{30}$-b-$MeOx_{36}$ (**P3**, 7.1×10^{-4} M). B) Comparison between pyrene fluorescence spectra in **P3 (**7.1×10^{-4} M) and the ionic liquid 1-butyl-2,3-dimethylimidazolium chloride ([bdmim]/[Cl]). For all experiment experimental conditions were: [pyrene] = 5×10^{-7} M, λ_{exc} = 333 nm, pH 7.2.

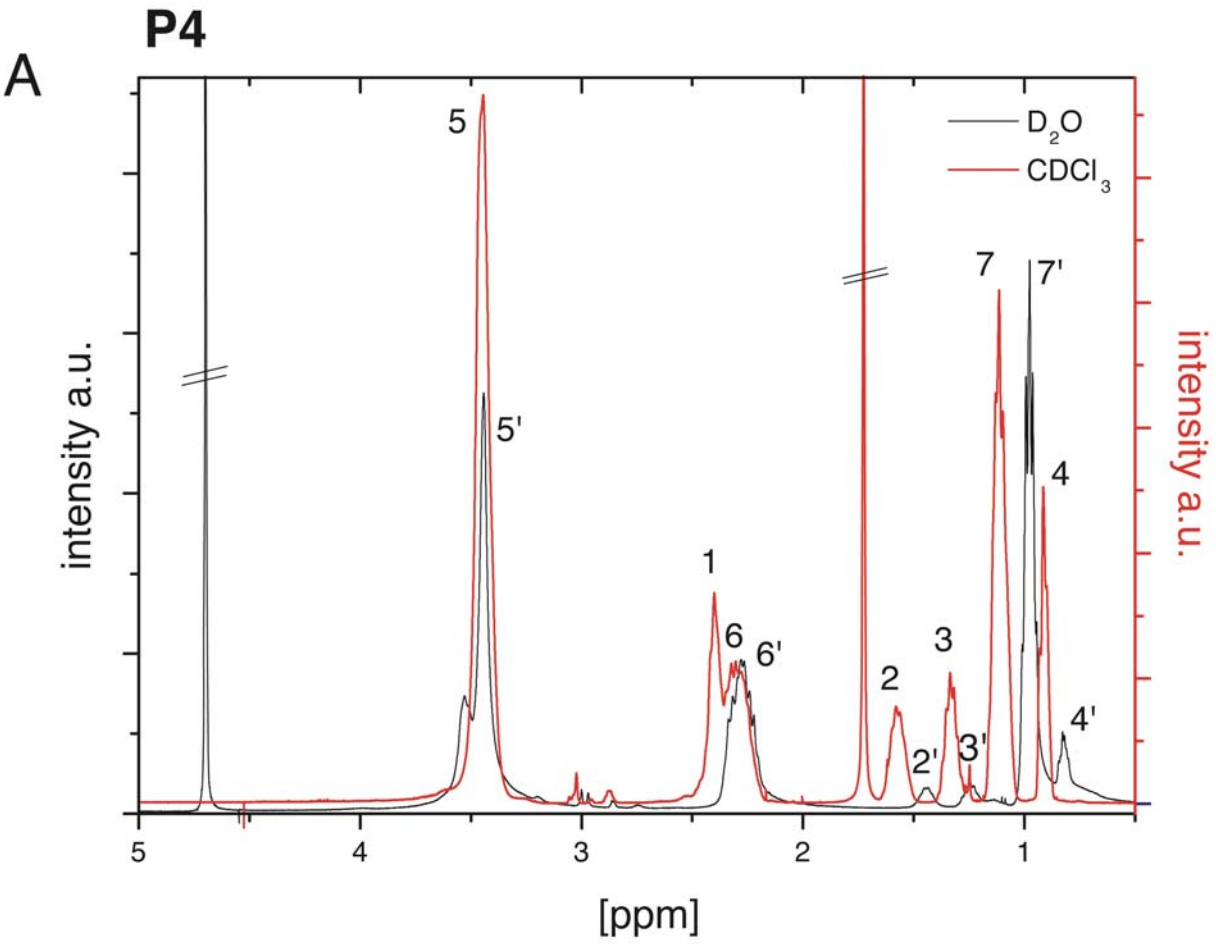


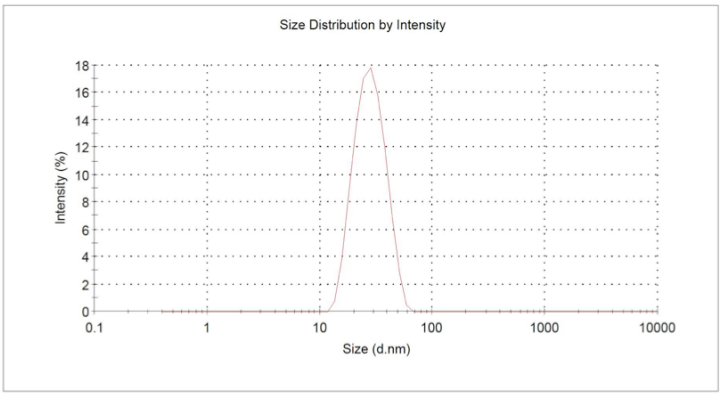
Fig. S2. Comparison of ^{1}H-NMR spectra of **P4** (300K, 400 MHz, normalized for methyl or ethyl side chain, respectively) in deuterated chloroform (no aggregates present) and D_2O (formation of polymeric micelles). Signals 1-4 ($CDCl_3$) and 1'-4'(D_2O) originated from butyl side chains in the hydrophobic block of **P4** signals 5/5' from polymer main chain and 6/6' and 7/7' from side chains in the hydrophilic block.

Results

P1

		Diam. (nm)	% Intensity	Width (nm)
Z-Average (d.nm): 26.43	Peak 1:	28.82	100.0	8.727
PdI: 0.077	Peak 2:	0.000	0.0	0.000
Intercept: 0.932	Peak 3:	0.000	0.0	0.000

Result quality : Good

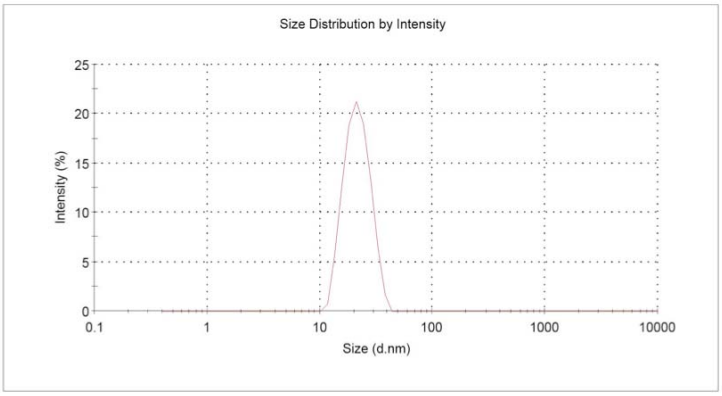


Results

P2

		Diam. (nm)	% Intensity	Width (nm)
Z-Average (d.nm): 20.72	Peak 1:	21.96	100.0	5.567
PdI: 0.043	Peak 2:	0.000	0.0	0.000
Intercept: 0.942	Peak 3:	0.000	0.0	0.000

Result quality : Good

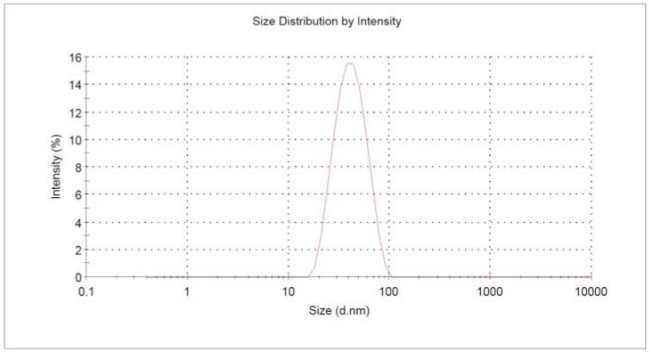


Results

P3

		Diam. (nm)	% Intensity	Width (nm)
Z-Average (d.nm): 37.79	Peak 1:	43.13	100.0	14.78
PdI: 0.118	Peak 2:	0.000	0.0	0.000
Intercept: 0.957	Peak 3:	0.000	0.0	0.000

Result quality : Good



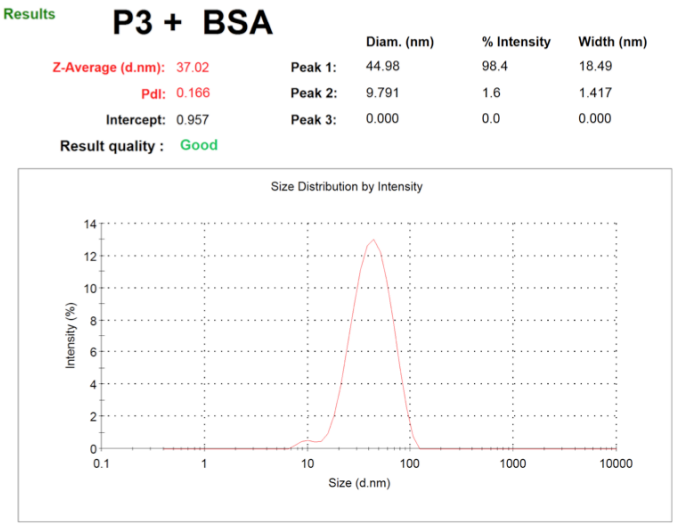


Fig. S3. Dynamic light scattering of drug loaded micelles of **P1** and **P2** (10 mg/mL), each 4mg/mL PTX and unloaded micelles of **P3** (5 mg/mL) in the presence and absence of 5 mg/mL bovine serum albumin (BSA).

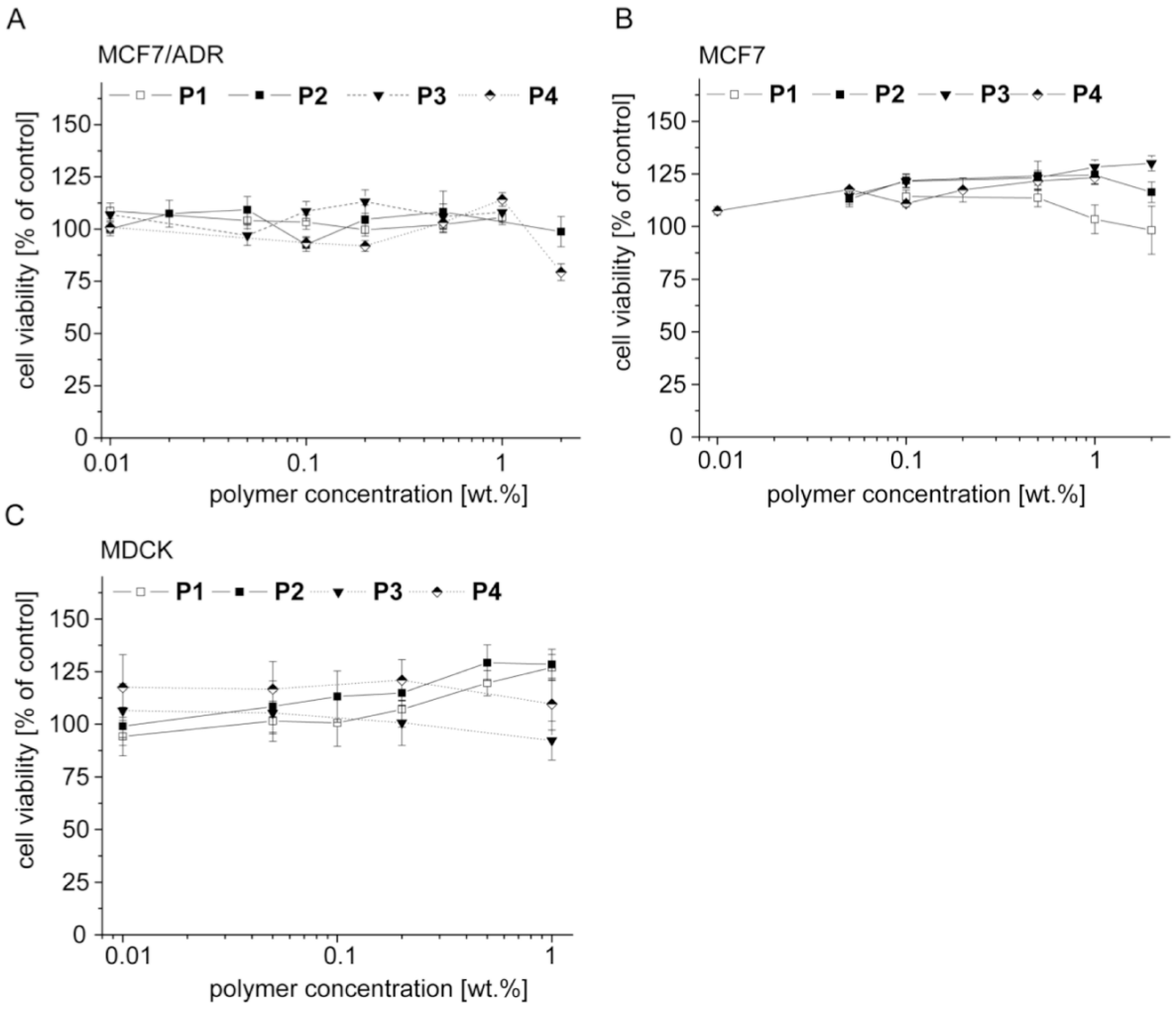


Fig. S4. Cytotoxicity of polymers **P1**-**P4** in A) multi-drug resistant (MCF7/ADR), B) non-resistant (MCF7) human adenocarcinoma cells and C) Madin-Darby canine kidney (MDCK) cells after incubation for 24 h (A) and 2 h (B,C). Data expressed as mean ± SEM (n = 4).

Table S1: I_1/I_3 ratios of pyrene fluorescence spectra determined in the current work (†) and previous accounts in different solvents and polymer solutions (above cmc).

Solvent / polymer solution	I_1/I_3
Hexane/Cyclohexane [2]	0.61 – 0.64 [7]
2-Nonyl-2-oxazoline based polymer [§]	1.20 – 1.38[†]
Methanol [3]	1.33 6 – 1.50
Pluronic P85 [4]	1.49† – 1.69[$]
Water [3]	1.75 – 1.96

N,N-dimethylacetamide	1.58 – 1.82
Acetonitrile [2]	1.85 – 1.88
DMSO [3]	1.90 – 2.03[†]
Ionic liquid [3]	1.84 [#] – 2.09[*†]
P1	2.16 – 2.21[†]
P2	2.08 – 2.11[†]
P3	2.30 – 2.35[†]
P4	2.29 – 2.33[†]

[*] 1-butyl-2,3-dimethylimidazolium chloride

[#] 1-butyl-3-methylimidazolium hexafluorophosphate

[$] graphically extracted from previous report [4]

[§] The polymer P[$(NOx)_{10}(MOx)_{32}$] was used in this experiment [1].

References:

(1) Bonné TB, Lüdtke K, Jordan R, Stepánek P, Papadakis CM. Aggregation behavior of amphiphilic poly (2-alkyl-2-oxazoline) diblock copolymers in aqueous solution studied by fluorescence correlation spectroscopy. Colloid Polym Sci 2004;282(8):833-43.

(2) Kalyanasundaram K, Thomas JK. Environmental effects on vibronic band intensities in pyrene monomer fluorescence and their application in studies of micellar systems. J Am Chem Soc 1977;99(7):2039-44.

(3) Fletcher KA, Storey IA, Hendricks AE, Pandey S. Behavior of the solvatochromic probes reichardt's dye, pyrene, dansylamide, nile red and 1-pyrenecarbaldehyde within the room-temperature ionic liquid bmimpf$_6$. Green Chem 2001;3(5):210-5.

(4) Kabanov AV, Nazarova IR, Astafieva IV, Batrakova EV, Alakhov VY, Yaroslavov AA, et al. Micelle formation and solubilization of fluorescent probes in poly (oxyethylene-b-oxypropylene-b-oxyethylene) solutions. Macromolecules 1995;28(7):2303-14.