

Supplementary Information

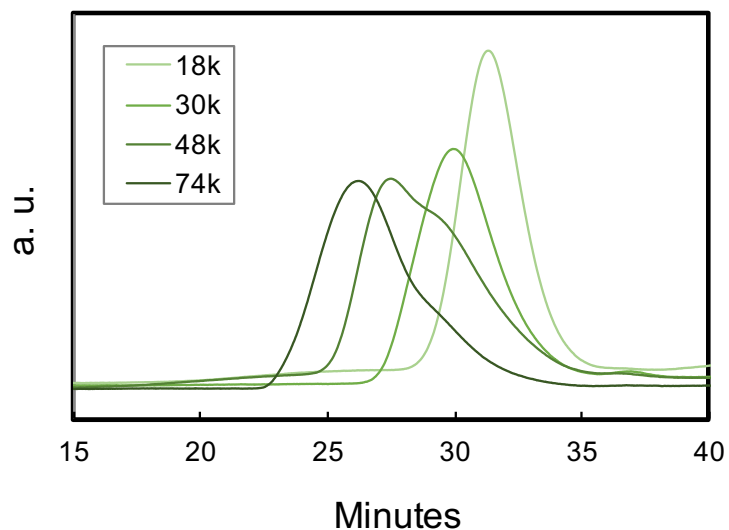
Fast and effective mitochondrial delivery of ω -Rhodamine-B-polysulfobetaine-PEG copolymers

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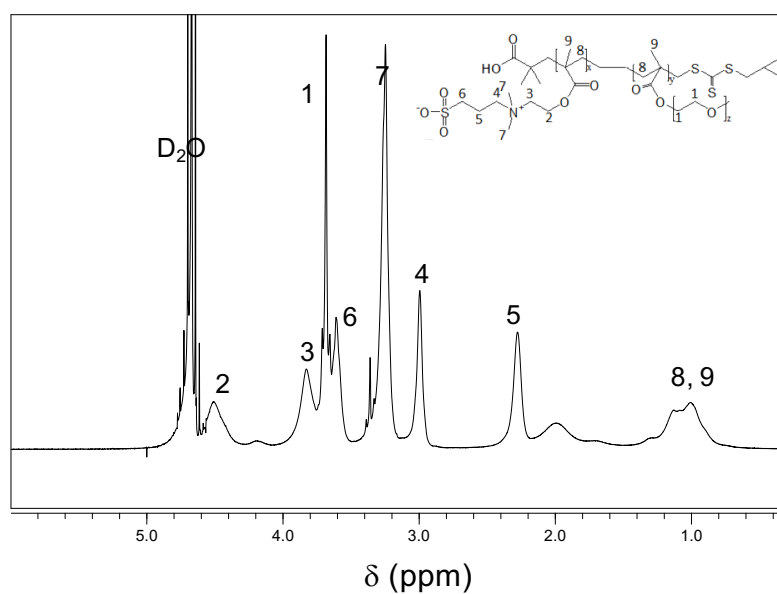
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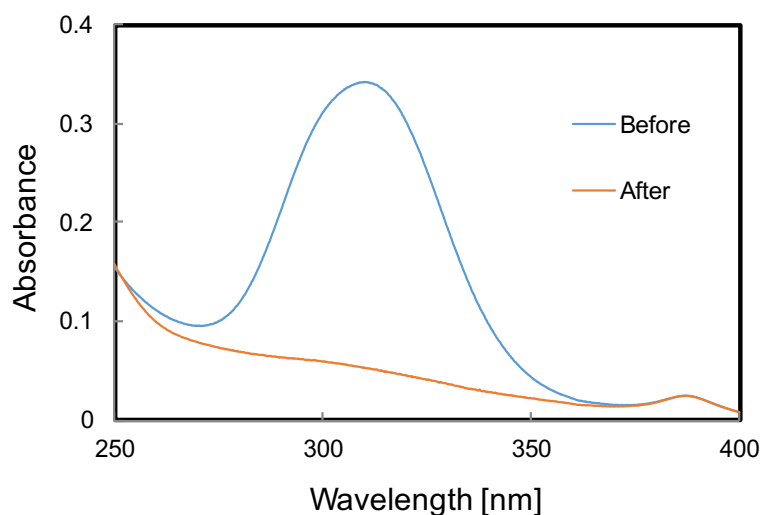
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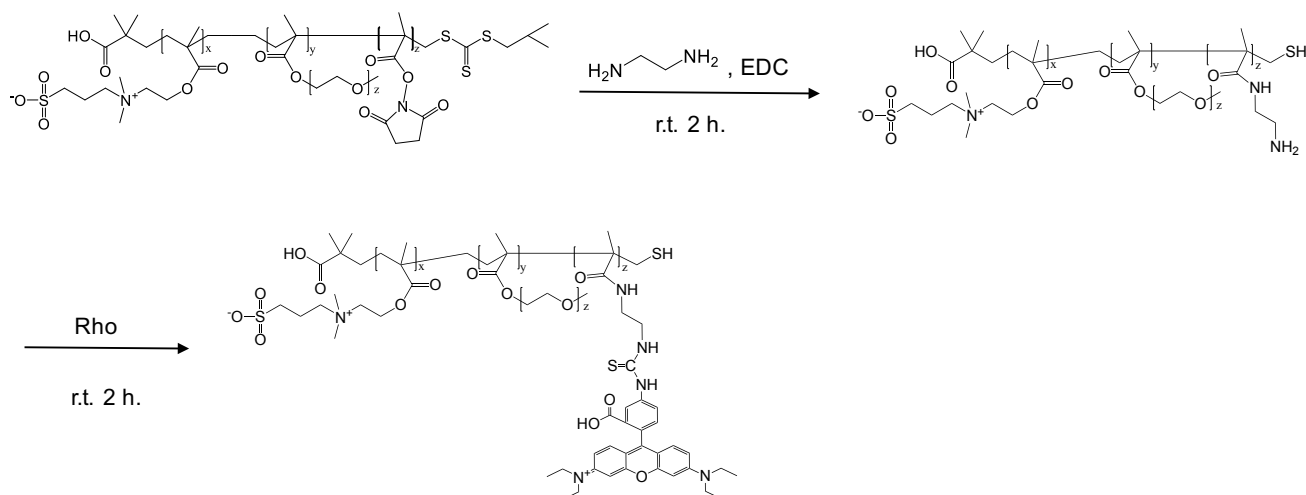
Supplementary Figure S1. Gel permeation chromatography (GPC) chromatograms of P(DMAPS-ran-PEGMA). GPC measurements were performed with a JASCO GPC system equipped with TSKgel G3000PW_{XL} and G4000PW_{XL} columns (Tosoh Co. Tokyo, Japan) eluted with aqueous NaNO₃ (100 mM). The molecular weights of the polymers were determined by calibration with PEG standards.



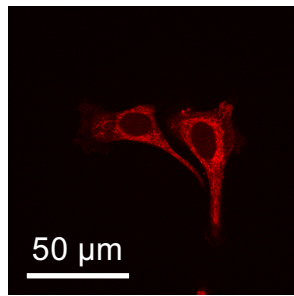
Supplementary Figure S2. ¹H-NMR spectrum of P(DMAPS-ran-PEGMA) in D₂O containing 1 M NaCl.



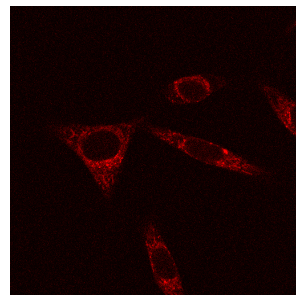
Supplementary Figure S3. UV-Vis spectra of P(DMAPS-ran-PEGMA) 18k before and after aminolysis reaction. The aminolysis reaction was applied to P(DMAPS-ran-PEGMA) in MES buffer (pH6.0) by addition of a large excess of *n*-butylamine (100 equiv.) for 2 h at r.t. in order to convert the ω -trithiocarbonate group to a thiol. The absorbance derived from trithiocarbonate group at 310 nm was disappeared by the conversion.



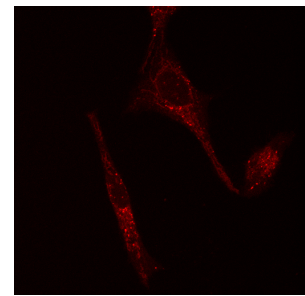
Supplementary Figure S4. Synthetic scheme of sRhoP



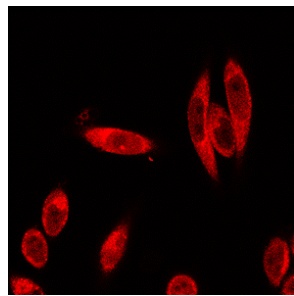
ω RhoP-21k



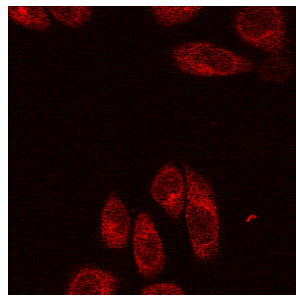
sRhoP-18k



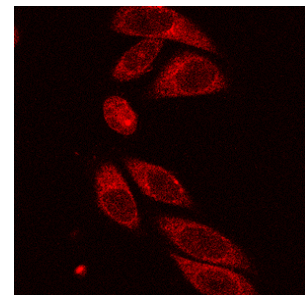
α RhoP*-29k



α RhoP-30k



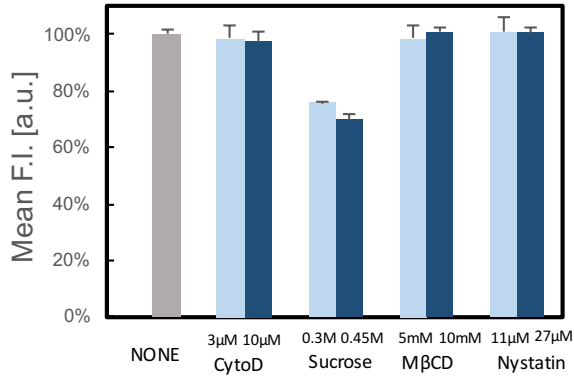
α RhoP-48k



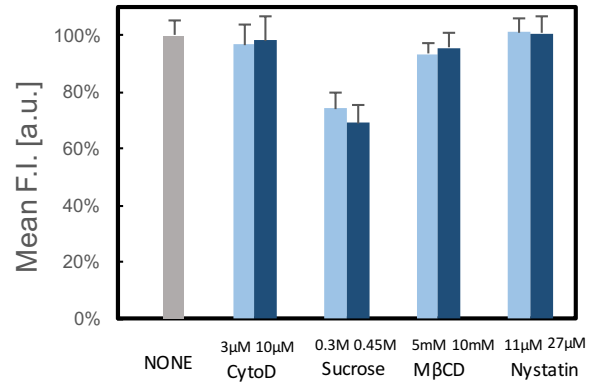
α RhoP-74k

Supplementary Figure S5. Localization RhoPs in HeLa cells. The images were obtained by CLSM after 1 h co-incubation with each polymer at 37 °C, 5% CO₂ in the presence of 10 % serum.

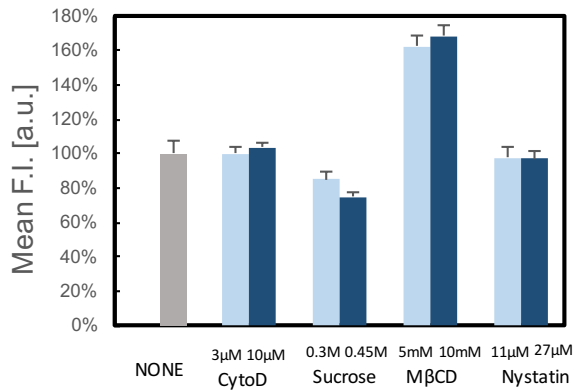
A α RhoP-18k



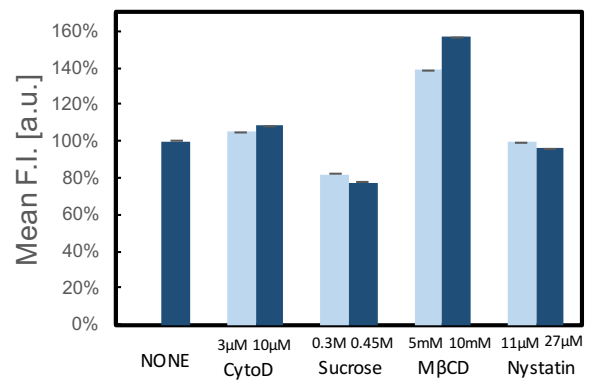
B ω RhoP-21k



C sRhoP-18k



D α RhoH-30k

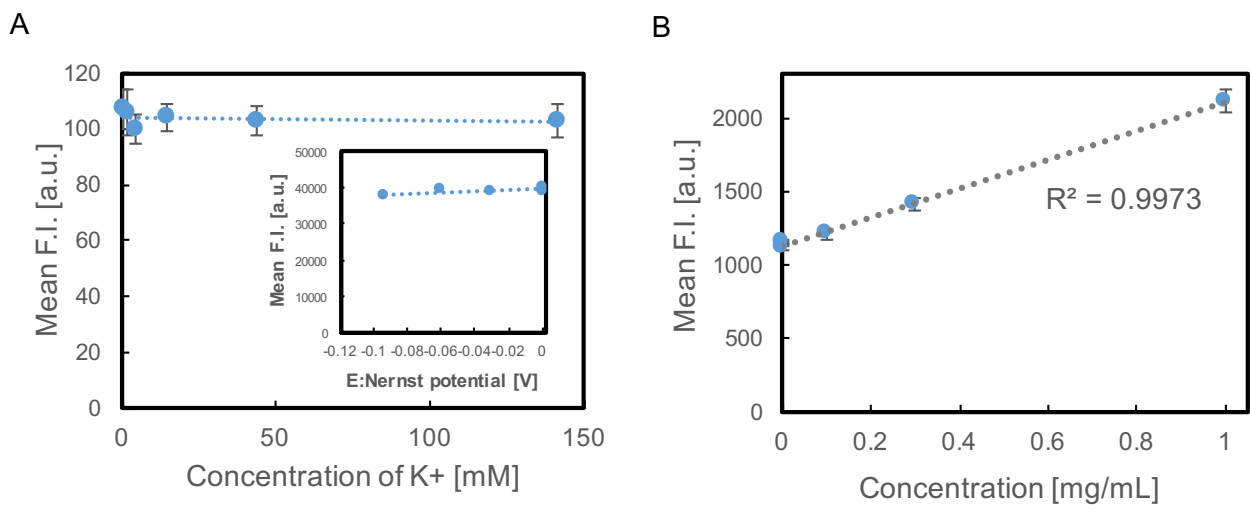


Supplementary Figure S6. Effects of the concentration of the endocytosis inhibitors

on the uptake of (A) α RhoP-18k, (B) ω RhoP-21k, (C) sRhoP-18k and (D) α RhoH-30k.

The fluorescence intensity of HeLa cells was evaluated by flow cytometry. CytoD:

Cytocharacine D, M β CD: methyl- β -cyclodextrin.



Supplementary Figure S7. (A) Fluorescence intensity of α RhoP in HeLa cells as a function of the potassium concentration during polymer uptake. (inset) Plot of the cellular uptake as a function of potassium Nernst potential. (B) Correlation between α RhoP concentration and the amount of cellular uptake. The concentration of α RhoP was ranged from 0.001 mg/mL to 1.0 mg/mL.

Supplementary Table S1. Buffer compositions with various potassium concentrations.

[K⁺] (mM)	0	1.5	4.2	14.5	43.8	141.2
[NaCl]	139.7	136.7	137	126.6	97.4	0
[KCl]	0	0	2.7	13.1	42.3	139.7
[Na ₂ HPO ₄]	9.6	8.1	8.1	8.1	8.1	8.1
[KH ₂ PO ₄]	0	1.5	1.5	1.5	1.5	1.5