

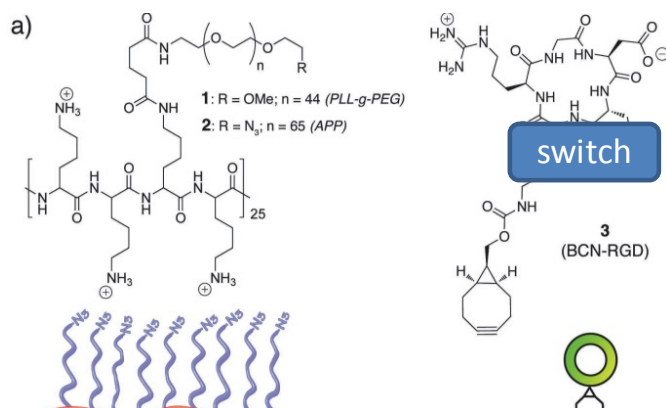
Straightforward coating by polymer switches to manipulate lipid membranes and cells.



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Polymer-coated surfaces are ubiquitous substrates for cell culture. Passive, static substrates are however limited compared to natural matrices that can dynamically affect cell migration, and proliferation, by spatial and temporal modulation of presentation of guidance cues. We tailor polymers that can switch on demand macromolecule-cell membrane association in cell culture conditions. Two “toolboxes” will be described: (1) soluble azobenzene-containing polyamphiphiles that bind to lipid bilayers and to cells under blue light, phototriggering mild cytosolic penetration of peptides. (2) Comb-like poly(Lysine)-g-PEO and PLL-g-(PNIPAM-co-ligand) derivatives that form adsorbed, cell-repellant layers, and switch on demand to an activated (cell-adherent) state. External triggers include temperature shifts, exposure to light, or copper-free click reaction with adhesion peptides. In addition to cell responses (e.g. triggering cell adhesion and migration on micropatterns), the switch between collapsed and extended conformations of surface-attached polymer strands was assessed by AFM and by observation of the capture of Streptavidin-conjugated particles.



- [1] Stijn F. M. van Dongen et al., *Adv. Mater.* 2013, 25(12):1687-91.
[2] S. Sebai, et al., *Angewandte Chemie Int Ed.*, 2012, 51, 2132-2136.