Conformation-Transformable Amphiphilic Copolymer with Poly(β-amino ester) via pH Switch

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A novel pH-sensitive copolymer was synthesized by grafting methoxypoly(ethylene glycol) (MPEG) to a poly(β-amino ester) (PAE) containing a hydroxyl group. The pH-sensitive properties of the new material were determined by means of dynamic light scattering and fluorescence spectroscopy. An excimer-forming pH-sensitive probe was prepared by conjugating 1-pyrenebutyric acid to a pH-sensitive copolymer, and fluorescence spectra were recorded to monitor the pH-sensitive excimer formation. Excimer emission was observed at 470 nm at pH values above 6.5, but it decreased at lower pH values, indicating that a conformational transition of the pH-sensitive copolymer from a globular to a coil conformation had occurred. These results are expected to be very helpful in improving pH sensors or drug delivery carriers by including the novel pH-sensitive MPEG-g-PAE.