

Supporting Information for
Glucose-sensitive polypeptide micelles for self-regulated insulin
release at physiological pH

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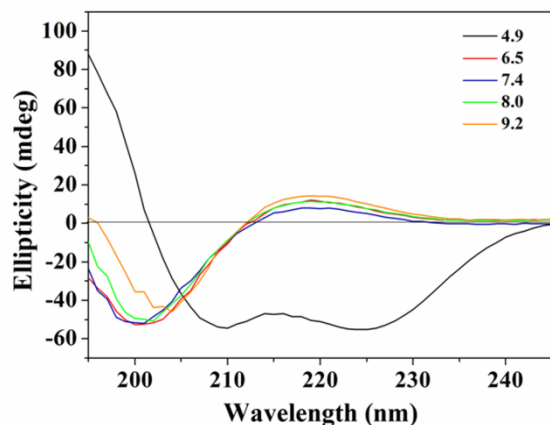


Fig. S1 CD spectra of PGP-95 solution at different pH values at 25 °C. The polymer concentration is 0.5 mg/mL.

The pH-dependent conformations of PGP-95 in PB at various pH were revealed by CD spectroscopy. As shown in Fig. S1, the CD spectrum of PGP-95 at pH 4.9 had two negative minima ($\lambda = 208$ and 223 nm), which suggested that the secondary structure of the copolymers was right-handed α -helix.¹ However, at pH above 6, the conformations of copolymer were random coil.²

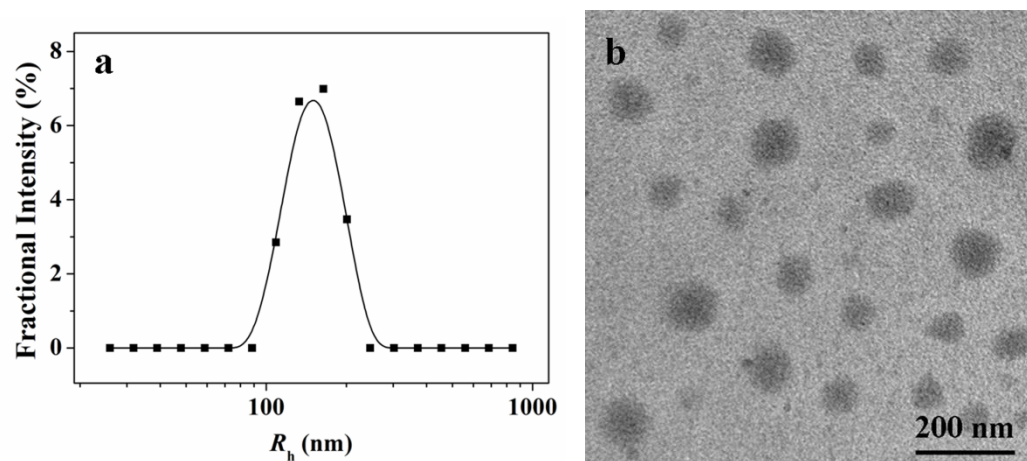


Fig. S2 The R_h and size distributions of PGP-95 micelle in PB 7.4 with 2.5 mg/mL glucose (a) and the TEM micrographs of the corresponding micelles in PB 7.4 with 0.05 mg/mL PGP-95 copolymer and 2.5 mg/mL glucose (b).

The R_h value of PGP-95 micelle was about 147.2 ± 6.0 nm in PB at pH 7.4 with 2.5 mg/mL glucose. And the TEM micrograph indicated that the micelles are spherical and the average diameter was about 90 nm. The smaller diameter value from TEM observation should be due to the collapse of hydrophilic shells during the TEM sample preparation.

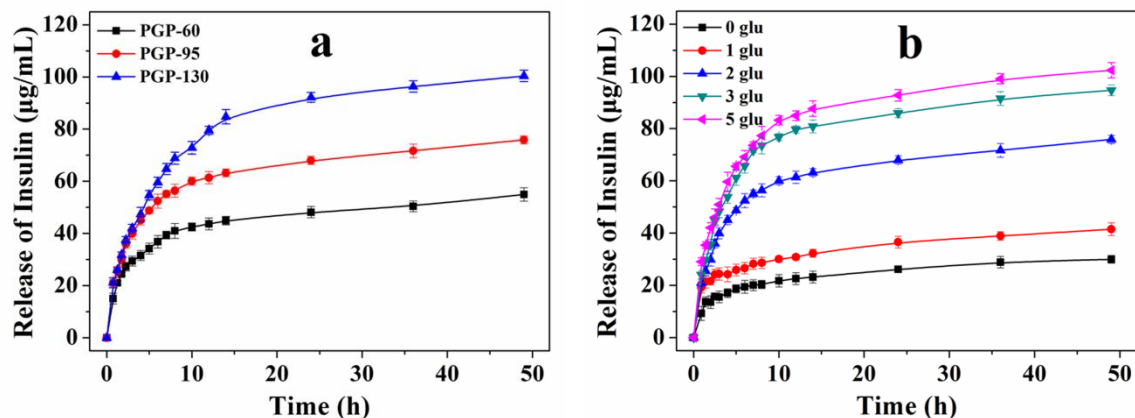


Fig. S3 The cumulative insulin release from various insulin-loaded mPEG-*b*-P(GA-*co*-GPBA) micelles in PB at pH 7.4, 37 °C, with the glucose concentration of 2.0 mg/mL (a), and from insulin-loaded PGP-95 micelle in PB with various glucose concentrations at pH 7.4, 37 °C (b). The markers in (b) of 0 glu, 1 glu, 2 glu, 3 glu and 5 glu represented the cumulative insulin release in PB with 0, 1.0, 2.0, 3.0 and 5.0 mg/mL glucose, respectively. Each datum represented the average of three independent determinations.

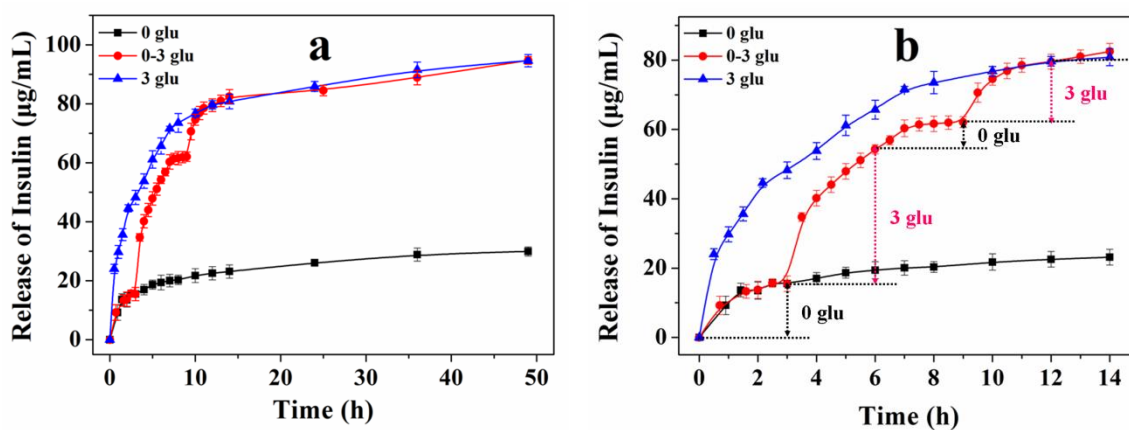


Fig. S4 The glucose-sensitive insulin release from insulin-loaded PGP-95 micelle in PB with alternant glucose concentrations at pH 7.4, 37 °C. The markers of 0 glu and 3 glu represented the cumulative insulin release in PB with 0 and 3.0 mg/mL glucose, respectively. The marker of 0-3 glu represented the cumulative insulin release in PB with alternant 0 or 3.0 mg/mL glucose. Each datum represented the average of three independent determinations.

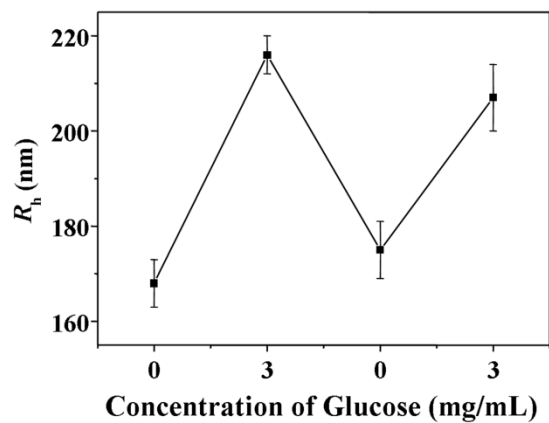


Fig. S5 Reversible glucose sensitivity of insulin-loaded PGP-95 micelle in PB with alternant glucose concentrations at pH 7.4, 37 °C.

- 1 J. Ding, C. Xiao, L. Zhao, Y. Cheng, L. Ma, Z. Tang, X. Zhuang and X. Chen, *J. Polym. Sci., Part A: Polym. Chem.*, 2011, **49**, 2665-2676.
- 2 K. Inoue, N. Baden and M. Terazima, *J. Phys. Chem. B*, 2005, **109**, 22623-22628.