## **Supporting information**

## A Bio-inspired Injectable Hydrogel as a Cell Platform for Real-Time Glycaemic Regulation

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Figure S1. The gelatin solution turned to a hydrogel as the temperature rose.

Figure S2A displayed the curves of storage modulus (*G*') and loss modulus (*G*'') of the prepared P(AAPBA-Dex-NIPAM) related to temperature ranges. The gelling temperature was determined by the cross-point of the *G*' and *G*''. As shown in the Figure S2B-S2D, the gelling temperature of these three formations of hydrogels was 14°C, 18°C and 28°C for P(AAPBA<sub>6</sub>-Dex-NIPAM<sub>64</sub>), P(AAPBA<sub>4</sub>-Dex-NIPAM<sub>66</sub>), P(AAPBA<sub>2</sub>-Dex-NIPAM<sub>68</sub>), respectively.



**Figure S2.** Dynamic rheological properties of (A) P(AAPBA-Dex-NIPAM) hydrogels over temperature. Gelling temperature of (B) P(AAPBA<sub>2</sub>-Dex-NIPAM<sub>68</sub>), (C) P(AAPBA<sub>4</sub>-Dex-NIPAM<sub>66</sub>) and (D) P(AAPBA<sub>6</sub>-Dex-NIPAM<sub>64</sub>) hydrogels, respectively.



**Figure S3.** Cell viability after incubation with different concentrations of  $P(AAPBA_2-Dex-NIPAM_{68})$ ,  $P(AAPBA_4-Dex-NIPAM_{66})$  and  $P(AAPBA_6-Dex-NIPAM_{64})$  hydrogels determined by MTT assay for 24 h.



**Figure S4.** Quantification of cell viability (by live/dead staining) after 3- and 7-day of incubation with 1 mL of P(AAPBA<sub>2</sub>-Dex-NIPAM<sub>68</sub>), P(AAPBA<sub>4</sub>-Dex-NIPAM<sub>66</sub>) and P(AAPBA<sub>6</sub>-Dex-NIPAM<sub>64</sub>) hydrogels, respectively.



Figure S5. SEM images of insulinoma cells encapsulated by  $P(AAPBA_2-Dex-NIPAM_{68})$  hydrogel on day 3 after cultivation.



**Figure S6.** The representative immunofluorescence images of the retrieved hydrogel sample stained with anti-insulin (insulin, green), DAPI (nuclei, blue), anti-CD68 or anti-TNF- $\alpha$  marked red. Scale bar: 100 µm.

Samples	AAPBA (mg/mL)	NIPAM (mg/mL)	Dex-Ma (mg/mL)	APS (mmol/L)	TMEDA (mmol/L)	Gelation time (s)
P(AAPBA <sub>2</sub> - Dex-NIPAM <sub>68</sub> )	2	68	1	20	20	60
P(AAPBA <sub>4</sub> - Dex-NIPAM <sub>66</sub> )	4	66	1	20	20	70
P(AAPBA <sub>6</sub> - Dex-NIPAM <sub>64</sub> )	6	64	1	20	20	65

**Table S1.** Gelation time of hydrogel with different compositions and concentrations.

**Table S2.** Drug release kinetic data for the hydrogels obtained from fitting drug release data to the Ritger-Peppas equation.

Samples	$M_t / M_\infty = \mathrm{kt}^\mathrm{n}$			Transport mechanism	
Samples	n	k	$R^2$	Transport meenament	
P(AAPBA <sub>2</sub> -Dex-NIPAM <sub>68</sub> )	0.6817	7.3777	0.9170	Non-Fickian diffusion	
P(AAPBA <sub>4</sub> -Dex-NIPAM <sub>66</sub> )	0.6650	8.4085	0.9135	Non-Fickian diffusion	
P(AAPBA <sub>6</sub> -Dex-NIPAM <sub>64</sub> )	0.6681	9.3336	0.9100	Non-Fickian diffusion	