

Biodegradable and pH Sensitive Peptide Based Hydrogel as Controlled Release System for Antibacterial Wound Dressing Application

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The crosslinking density ($1/M_c$) could be estimated by Flory-Rehner's equation (Equation S1 and S2) as shown below [1,2].

$$Q_V^{5/3} = \frac{v}{V} \left(\frac{1}{2} - x \right) M_c \quad (\text{S1})$$

$$Q_V = 1 + \frac{\rho}{\rho_s} (Q_M - 1) \quad (\text{S2})$$

In this equation, M_c is average molar mass between the network crosslinks, Q_V is the volume swelling ratio of hydrogels, v is the polymer volume, V is the molar volume of H_2O , x is the Flory interaction parameter between a solvent and a polymer, ρ is the polymer density and ρ_s is the density of H_2O . The estimation crosslinking density result of hydrogels (pH = 7) is shown below.

Table S1. Calculation results of crosslinking density of hydrogels (pH = 7).

Hydrogel	Crosslinking Density (10^{-5})
Gel-1	5.2
Gel-2	5.7
Gel-3	6.0
Gel-4	6.8

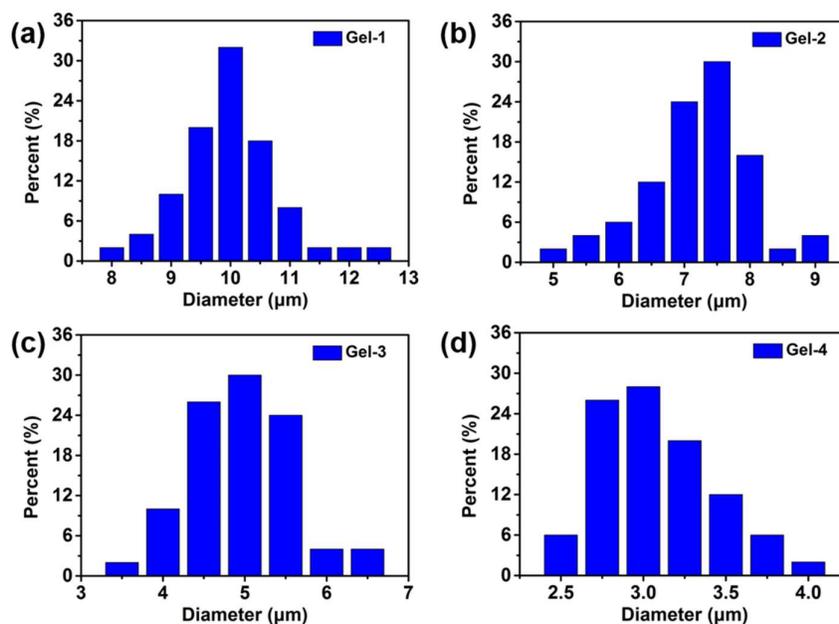


Figure S1. The pore size and size distribution measured from the SEM images of freeze-dried (a) Gel-1, (b) Gel-2, (c) Gel-3 and (d) Gel-4 hydrogels. The pore sizes of Gel-1, Gel-2, Gel-3 and Gel-4 were about 9.78 ± 1.59 , 7.22 ± 1.46 , 4.79 ± 0.86 and 3.00 ± 0.46 μm , respectively. It could be seen that with the increasing of peptide-based bis-acrylate contents, the pore size of the hydrogels would decrease.

References

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2. Adnadjevic, B.; Jovanovic, J. Hydrogel synthesis directed toward tissue engineering: impact of reaction condition on structural parameters and macroscopic properties of xerogels. *Int. J. Polym. Sci.* **2011**, *343062*, DOI: 10.1155/2011/343062.