Supporting Information for

Antibacterial Coordination Polymer Hydrogels Consisted of Silver(I)-PEGylated Bisimidazolylbenzyl Alcohol

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**Synthesis**

Scheme 1S. Synthesis of compounds 1a-c

![Scheme Diagram]

**Compound 2.** A Schlenk flask was charged with (3,5-dibromophenyl) methanol (106.38 mg, 0.4 mmol), imidazole (68.08 mg, 1 mmol), CuI (15.24 mg, 0.08 mmol), N,N-dimethylglycine (16.5 mg, 0.16 mmol), and K$_2$CO$_3$ (221.14 mg, 1.6 mmol). The system was then evacuated twice and back filled with N$_2$, followed by addition of 4 mL of DMSO. The mixture was heated at 110 °C for 48 h before it was partitioned between water and ethyl acetate. The organic layer was separated, and the aqueous layer was extracted with ethyl acetate (3 × 10 mL). The combined organic layers were washed with brine, dried over MgSO$_4$, and concentrated *in vacuo*. The residue was loaded on a silica gel column and eluted with CH$_2$Cl$_2$/CH$_3$OH (10/1) to give the compound 2 as a white solid with the yield of 48%.

**Compound 3a-c.** To a solution of poly(ethylene glycol) monomethyl ether (10 mmol) and *p*-toluenesulfonyl chloride (3.81 g, 20 mmol) in 20 mL of anhydrous CH$_2$Cl$_2$, pyridine (1.6 mL) was added. The reaction mixture was stirred at 25 °C under N$_2$ atmosphere for 24 h. After the addition of 5 mL aqueous solution of HCl (1 M), the mixture was extracted with CH$_2$Cl$_2$ (3 × 30 mL). The combined organic layers were washed with brine, dried over MgSO$_4$, and concentrated *in vacuo*. The residue was
loaded on a silica gel column and eluted with CH₂Cl₂/CH₃OH (10/1) to give the desired product as a colorless oil.

**Compound 1a.**² NaH (9.60 mg, 0.4 mmol) was added to a solution of compound 2 (48.1 mg, 0.2 mmol) in dry N,N-dimethylformamide (DMF, 2 mL) at room temperature. After the mixture was stirred at room temperature for 1 h, compound 3a (83.4 mg, 0.24 mmol) in an anhydrous DMF (1.5 mL) was added slowly. The reaction mixture was stirred at 100 °C under N₂ atmosphere for 20 h, cooled to room temperature, and poured over 10 mL of icy water. The mixture was extracted with CH₂Cl₂ (3 × 10 mL). The combined organic phase was washed with brine (30 mL), dried over MgSO₄, and concentrated in vacuo. The residue was loaded on a silica gel column and eluted with CH₂Cl₂/CH₃OH (10/1) to give the product as a colorless oil with the yield of 78%. ¹H NMR (400 MHz, CDCl₃): δ 3.32 (S, 3 H), 3.49-3.71 (m, 16H), 4.66 (S, 2H), 7.21 (S, 2H), 7.33 (S, 3H), 7.39 (S, 2H), 7.93(S, 2H). ¹³C NMR (CDCl₃, 100 MHz): δ 58.93, 70.21, 70.48, 70.58, 113.20, 118.09, 118.61, 130.77, 135.52, 143.13. High resolution ESI-MS: [M+H]+ calcd for C₂₂H₃₁N₄O₅⁺ 431.2294, found 431.2287.

**Compound 1b.** Following the synthetic procedure of compound 1a, compound 2 (50 mg, 0.21 mmol), NaH (9.96 mg, 0.42mmol), and compound 3b (87.51 mg, 0.25mmol) were used. The residue was loaded on a silica gel column and eluted with CH₂Cl₂/CH₃OH (10/1) to give compound 1b as a colorless oil with the yield of 82%. ¹H NMR (400 MHz, CDCl₃): δ 3.34 (S, 3H), 3.51-3.71 (m, 48H), 4.67 (S, 2H), 7.22 (S, 2H), 7.37 (S, 2H), 7.41 (S, 3H), 8.01 (S, 2H). ¹³C NMR (100 MHz, CDCl₃): δ 58.95, 70.18, 70.59, 71.76, 113.30, 118.17, 118.63, 130.43, 135.52, 143.15. High resolution ESI-MS: [M+H]+ calcd for C₃₈H₆₃N₄O₁₃⁺ 783.4392, found 783.4383. Pairs of peaks correspond to different length oligomers (each pair containing a [M + H]+).
**Compound 1c.** Following the synthetic procedure of compound 1a, compound 2 (50 mg, 0.21 mmol), NaH (9.96 mg, 0.42 mmol), and compound 3c (294.7 mg, 0.25 mmol) were used. The residue was loaded on a silica gel column and eluted with CH$_2$Cl$_2$/CH$_3$OH (10/1) to give compound 1c as a colorless oil with the yield of 80%. $^1$HNMR (400MHz, CDCl$_3$): $\delta$ 3.33 (S, 3H), 3.49-3.70 (m, 72H), 4.66 (S, 2H), 7.20 (S, 2H), 7.34 (S, 3H), 7.39 (S, 2H), 7.94 (S, 2H). $^{13}$CNMR (CDCl$_3$, 100 MHz): $\delta$ 58.98, 70.16, 70.50, 70.61, 113.23, 118.12, 118.57, 130.71, 135.53, 143.07 High resolution ESI-MS: [M+Na]$^+$ calcd for C$_{56}$H$_{98}$N$_4$NaO$_{22}$ $^+$ 1201.6570, found 1201.6539. Pairs of peaks correspond to different length oligomers (each pair containing a [M + Na]$^+$).

**References**

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2. M. A. Azagarsamy, P. Sokkalingam, S. Thayumanavan, *J. Am. Chem. Soc.*, 2009, **131**, 14184-14185.
Fig. 1S. TEM micrograph of coordination polymer hydrogel of Ag/1c.

Fig. 2S. OD600 values for *S. aureus* (a) and *E. coli* (b) with different concentrations of ligands 1a-c.
Fig. 3S. *In vitro* cytotoxicity of ligands 1a-c against 293T cells after incubation for 24 h at 37 °C with a series of concentrations. 293T cells incubated without any materials were used as the control (mean ± SD, n = 6).
$^1$H, $^{13}$C NMR, and MS Spectra of Compounds 1a-c
