Electronic Supplementary Information (ESI)

Synthesis of glycopolymers with specificity for bacterial strains via bacteria-guided polymerization

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Characterization of polymers by NMR and GPC

Figure S1 $^1$H-NMR spectrum of MAG.

Figure S2 $^1$H-NMR and $^{13}$C-NMR spectrum of pMAG

Figure S3 $^1$H-NMR and $^{13}$C-NMR spectrum of pMEDSA
Figure S4 H-NMR and $^{13}$C-NMR spectrum of NP

Figure S5 H-NMR and $^{13}$C-NMR spectrum of RP

Figure S6 H-NMR and $^{13}$C-NMR spectrum of SP
Figure S7 $^1$H-NMR and $^{13}$C-NMR spectrum of BP.

Figure S8 $^1$H-NMR spectrum of SP2.

Figure S9 $^1$H-NMR spectrum of BP2.
GPC measurements

![Figure S10: The GPC elution profiles of polymers.](image)

Calculation of monomer composition of copolymers

The composition ratio was calculated by comparing the CH$_3$ (peak 5, Figure S3-S9) of quaternary amine which belong to MEDSA and protons (peak 2-4, Figure S3-S9) belonging to MAG and MEDSA (2-4, Figure S5). The results of calculation are shown in the Table S1.

Bacteria aggregation

![Figure S11: Template bacteria (E.coli MG1655) clusters by different treatment.](image)

![Figure S12: Non-template bacteria (E.coli DH5α) clusters by different treatment.](image)
Both the two strains of bacteria clusters by different treatment in the mixed state.

QCM results

Figure S14 A) Frequency change with time of template bacteria layers on contact with the different polymer solutions (NP, SP, BP). B) Frequency change with time of non-template bacteria layers on contact with the different polymer solutions (NP, SP, BP).

Figure S15 Final frequency change following the interaction between bacteria and polymers.
**E. coli MG1655**  
**E. coli DH5α**

![Bar charts showing the number of bacteria adhered to the chips.](image)

**Figure S16** Number of bacteria adhered to the chips.

**Bacterial aggregation by turbidimetry**

![Graph showing the change of optical density (600nm) for both template (MG1655) and non-template (DH5α) bacteria with time after addition of glycopolymers (SP, BP).](image)

**Figure S17** The change of optical density (600nm) for both template (MG1655) and non-template (DH5α) bacteria with time after addition of glycopolymers (SP, BP).

**Characterization of Golden nano-particles (GNPs) decorated with polymers**

**TEM measurements**
Dynamic Light scattering (DLS) measurements

![DLS graph showing size distribution of GNP, GNP-SP, and GNP-BP](image)

**Figure S19** DLS characterization of GNP-SP, GNP-BP and GNP.

Zeta potential measurements

| Samples       | GNP      | GNP-SP   | GNP-BP   |
|---------------|----------|----------|----------|
| Zeta Potential (mV) | -36.2 ± 1.7 | -30.6 ± 2.6 | -32.2 ± 1.2 |

**Table S1** The zeta potential of GNP-SP, GNP-BP, and GNP

Inhibition experiments
Figure S20 Inhibiting effects of glycopolymers in the anti-infection experiment.