Supporting Information

High Selective Performance of Rationally Designed Antimicrobial Peptides Based on Ponericin-W1

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A) At1

B) At2

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C) At3

D) At4

E) At5

F) At6
G) At7

H) At8

I) At9

J) At10
Figure S1. HPLC chromatograms of At1-At12 peptides. HPLC conditions: The peptide concentration was fixed at 1 mg/mL. Analytical column type: SHIMADZU Inertsil ODS-SP (4.6 x 250 mm x 5 μm). Eluent A (0.1% trifluoroacetic in water) and eluent B (0.1% trifluoroacetic in acetonitrile). The flow rate was 1 mL/min and the UV detector was set at 214 nm.
Figure S2. Mass spectrum of peptides.
Figure S3. The MIC of antimicrobial peptides to gram-negative bacteria *E. coli* (A-B) and *P. aeruginosa* (C-D).

Figure S4. Bacteria The MIC of antimicrobial peptides to gram-positive bacteria *S. aureus* (A-B) and *E. faecalis* (C-D).
Figure S5. Hemolytic activities of peptides (At1-At12). Human red blood cells (hRBCs) were treated with different concentrations of peptides and incubated for 1 h at 37 °C. Then measure the absorbance at OD$_{540\text{nm}}$. 
Figure S6. CD spectra of peptides in (A) water, (B) zwitterionic DPPC SUVs (0.25 mg/mL) solution, (C) 25 mM SDS and (D) negatively charged DPPG SUVs (0.25 mg/mL).
**Figure S7.** Live/Dead staining assay of *E. coli* and *S. aureus* before and after the treatment of At3 peptides at different concentrations for 2 h at 37 °C.

**Figure S8.** Live/Dead staining assay of *E. coli* and *S. aureus* before and after the treatment of At8 peptides at different concentrations for 2 h at 37 °C.
**Figure S9.** Live/Dead staining assay of *E. coli* and *S. aureus* before and after the treatment of At10 peptides at different concentrations for 2 h at 37 °C.

**Figure S10.** Development of antimicrobial resistance (AMR). *S. aureus* bacteria treated with At3 peptide (25 passages).