Supporting Information

Integration of antimicrobial peptides and gold nanorods for bimodal antibacterial applications

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Table S1. The statistical results of five kinds of gold nanorods

Particles	Length (nm)	Width (nm)	Aspect Ratio
AuNR@CTAB	**60.8±6.2**	**15.4±3.1**	**3.9±0.7**
AuNR@PEG	**59.7±6.1**	**13.8±2.2**	**4.3±1.0**
AuNR@PEG/BF2b1	**56.9±6.0**	**13.9±2.2**	**4.2±0.8**
AuNR@PEG/BF2b3	**56.0±6.0**	**13.7±2.6**	**4.1±0.9**
AuNR@PEG/BF2b5	**57.4±6.0**	**13.6±2.2**	**4.2±1.0**

Table S2. Surface area and volume of gold nanorods and BF2b density on gold nanorods' surface

Gold nanorods	Surface area (nm^2)	Volume (nm^3)	Mass (10^{-16} g)	Quantity of nanorods (10^{13} /ml)	Quantity of BF2b (10^{14} /ml)	Quantity of BF2b (nm^{-2})
AuNR@PEG/BF2b1	**2490. 5±478.1**	**7956.3±2554.6**	**1.5±0.5**	**0.78**	**44.8**	**0.23**
AuNR@PEG/BF2b3	**2417.8±522.3**	**7621.4±2855.1**	**1.5±0.5**	**0.48**	**34.2**	**0.29**
AuNR@PEG/BF2b5	**2284.5±453.5**	**6703.7±2281.9**	**1.3±0.4**	**0.56**	**34.1**	**0.27**

Note: The density of gold is about 19.3 g/cm^3. The molecular weight of BF2b and PEG is around 2765.5 and 800 Da, respectively. In the same way as shown in the table, we can calculate the molecular quantity of PEG on the surface of gold nanorods as well. It is about 1.87 per nm^2. The ratio of PEG on gold nanorods was obtained via thermalgravimetric analysis (Fig. S3).

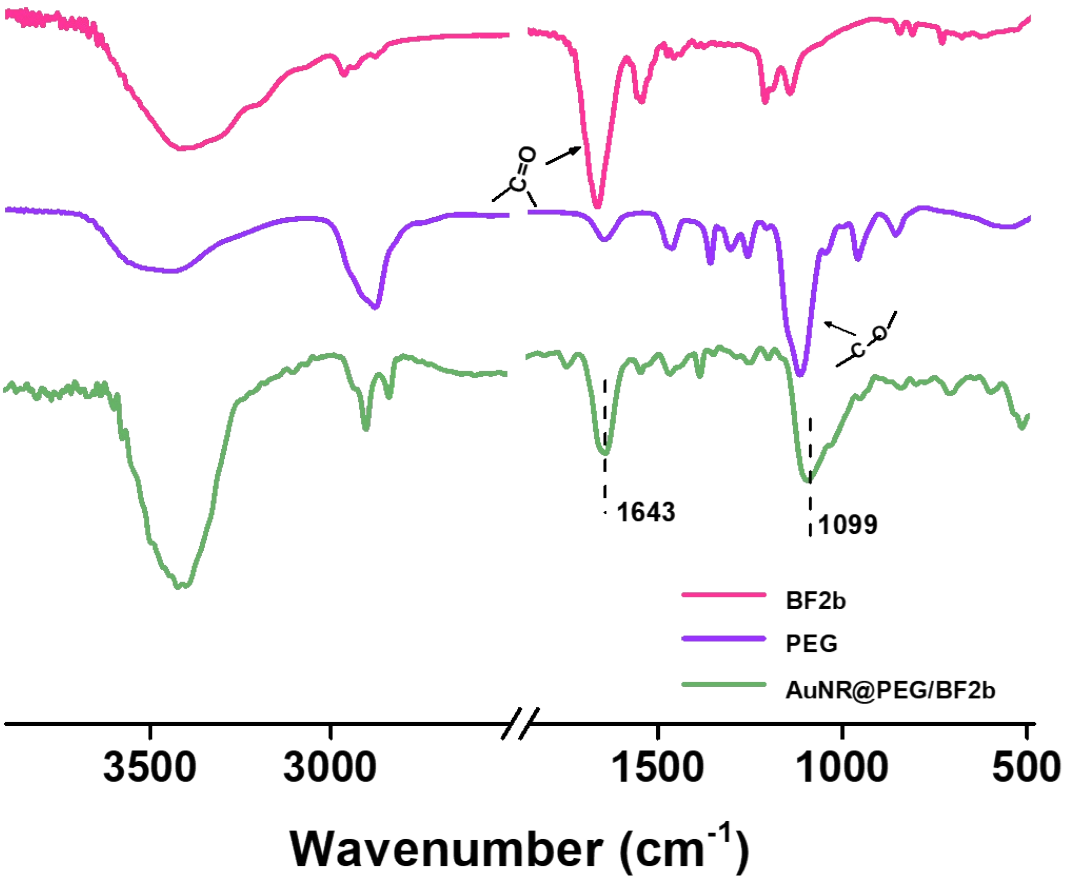

Figure S1. FTIR spectra of pure BF2b (orange), pure PEG (purple) and gold nanorods modified with PEG and BF2b (AuNR@PEG/BF2b, green curve).

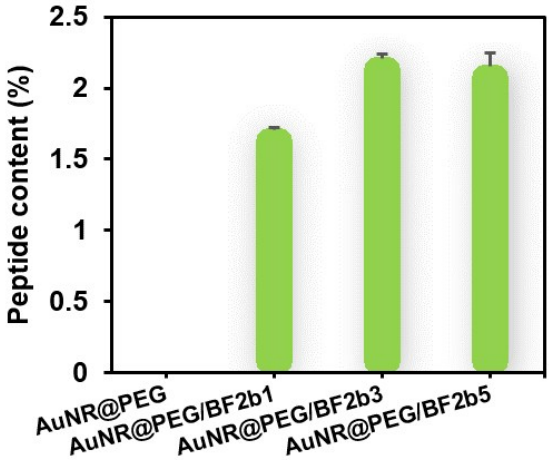

Figure S2. Peptide mass contents on different AuNRs. AuNR@PEG/BF2b1, AuNR@PEG/BF2b3 and AuNR@PEG/BF2b5 stand for the AuNRs treated with PEG/BF2b mixture with the ratio of PEG-SH : BF2b = 1:1, 1:3 and 1:5, respectively.

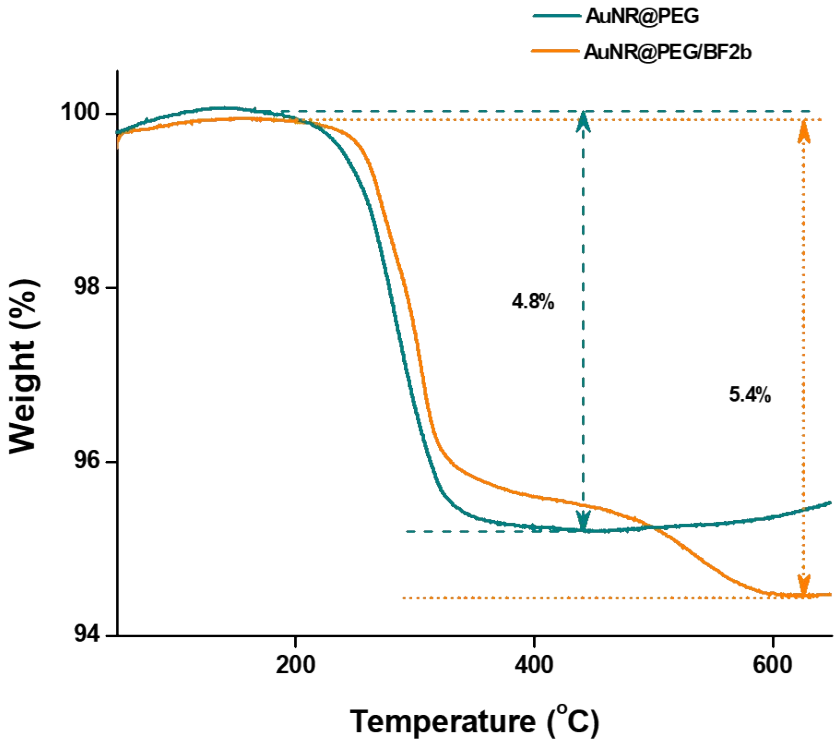

Figure S3. Weight loss of AuNR@PEG and AuNR@PEG/BF2b1 as a function of temperature measured by thermogravimetric analysis.

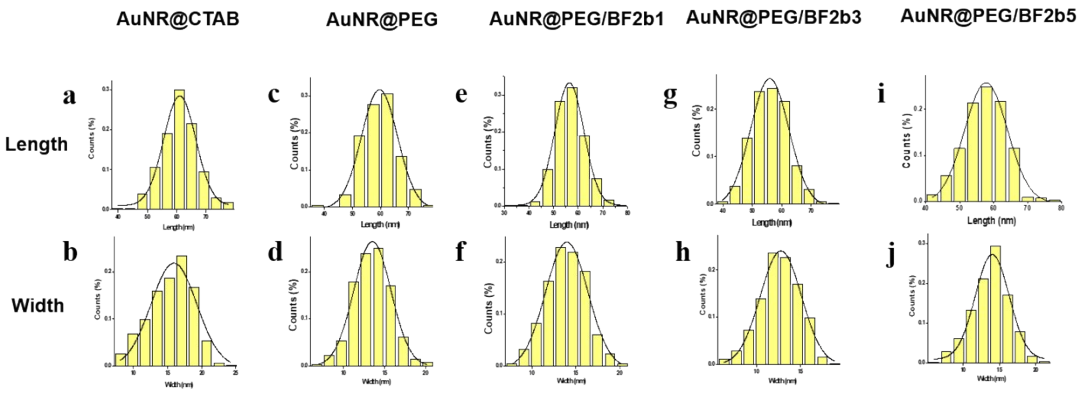

Figure S4. Statistical results of the (a,c,e,g,i) length and (b,d,f,h,j) width of (a,b) AuNR@CTAB, (c,d) AuNR@PEG, (e,f) AuNR@PEG/BF2b1, (g,h) AuNR@PEG/BF2b3, and (i,j) AuNR@PEG/BF2b5 based on the corresponding TEM images. Sample sizes are around 400.

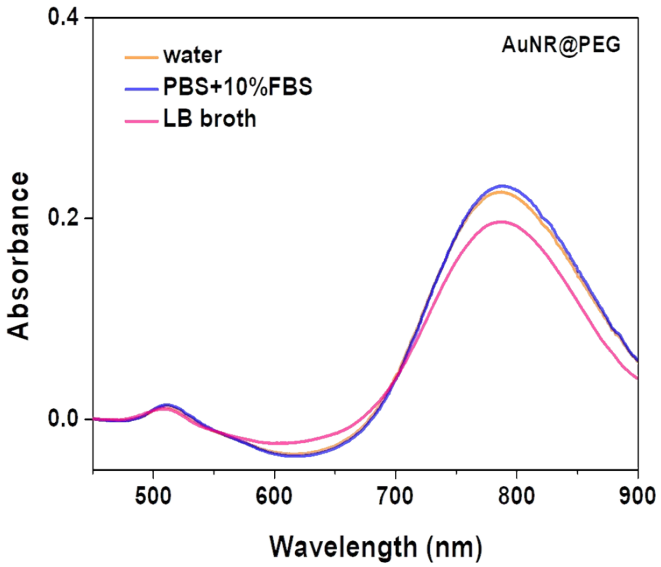

Figure S5. UV-vis spectrum of AuNR@PEG in different media.

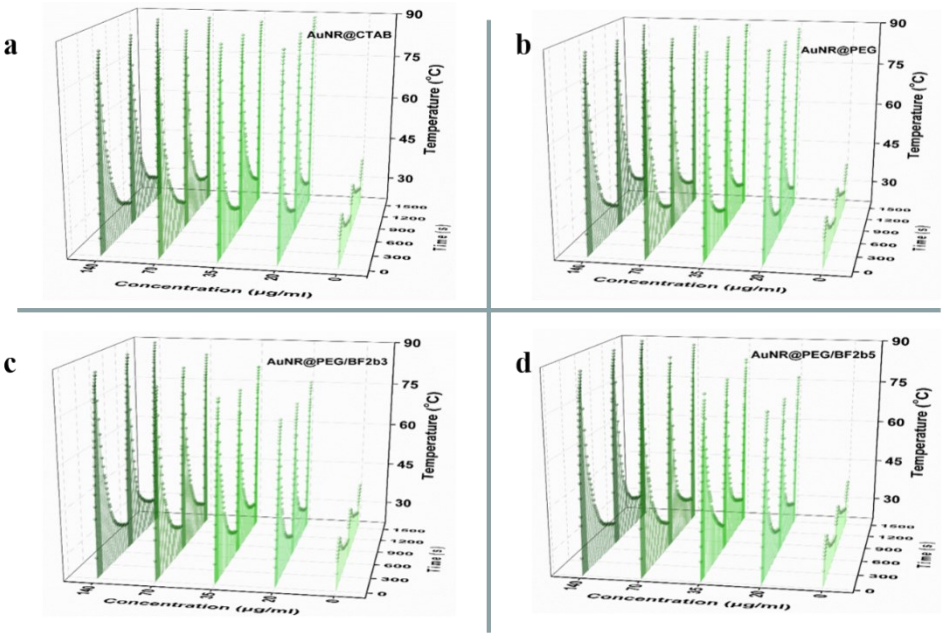

Figure S6. Photothermal properties of (a) AuNR@CTAB, (b) AuNR@PEG, (c) AuNR@PEG/BF2b3 and (d) AuNR@PEG/BF2b5, respectively. The samples were heated for 1 min and then allowed to cool down for 10 min at room temperature.

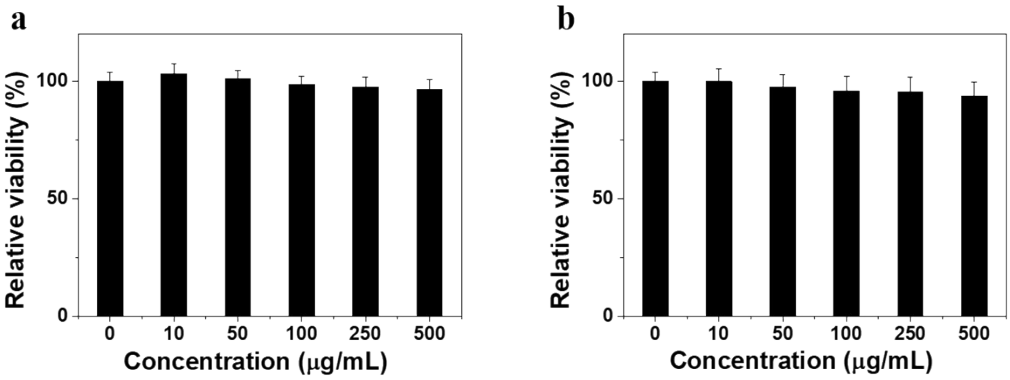

Figure S7. Viability of ECs treated with various concentrations of Au@BF2b for (a) 3 days and (b) 7 days, respectively.

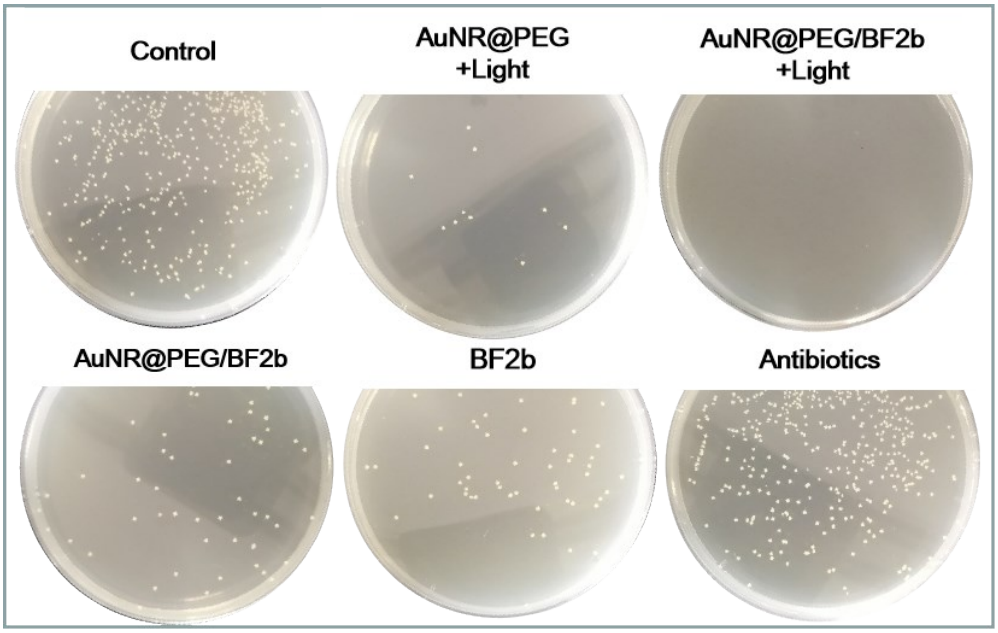

Figure S8. Digital images of MRSA plates of MRSA received different treatment.