Supporting Information

A quorum-based fluorescent probe for imaging pathogenic bacteria

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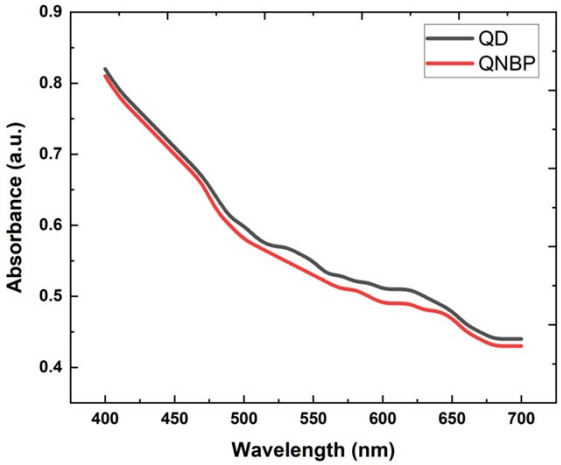

Fig S1. UV-visible spectra of bare QDs and QNBPs. The absorbance of bare QDs and post bioconjugation was measured between 400-700 nm.

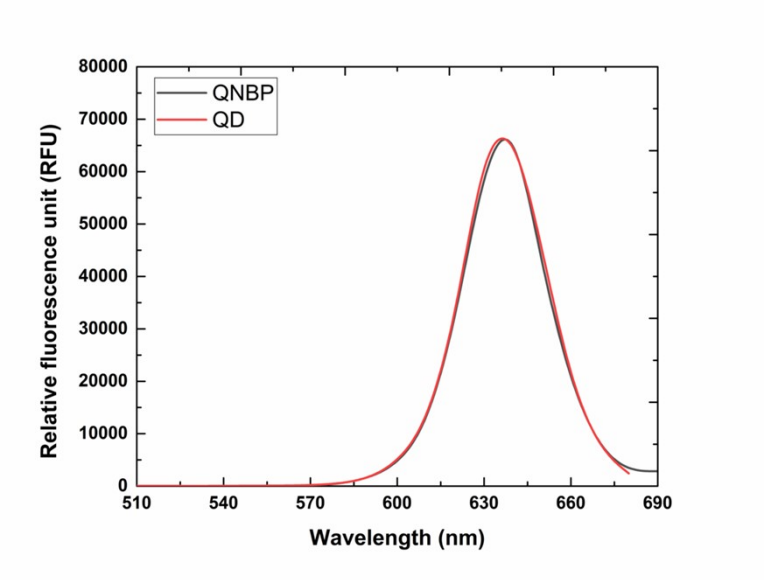

Fig S2. Fluorescence spectra of bare QDs and QNBPs.

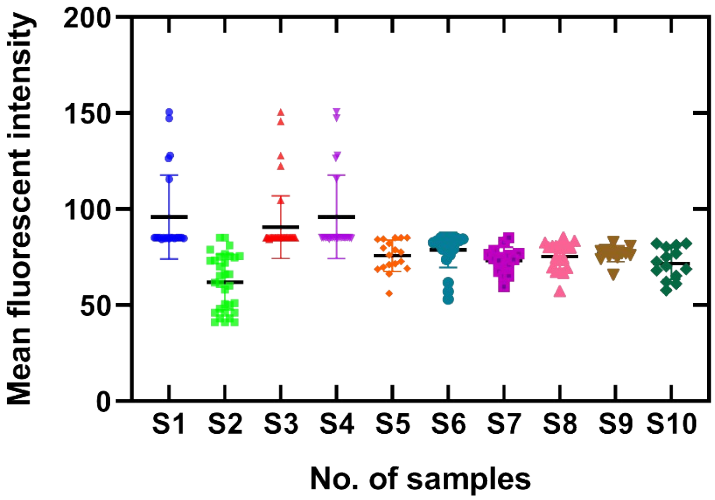

Fig. S3. Binding between QNBPs and various clinical *S. aureus* isolates. The clinical *S. aureus* isolates (*S1–S10*) were incubated with QNBPs, and imaging was performed. The fluorescent intensity of individual cells from all the isolates was quantified. All the strains were positive for binding with QNBPs with a similar mean fluorescence intensity.

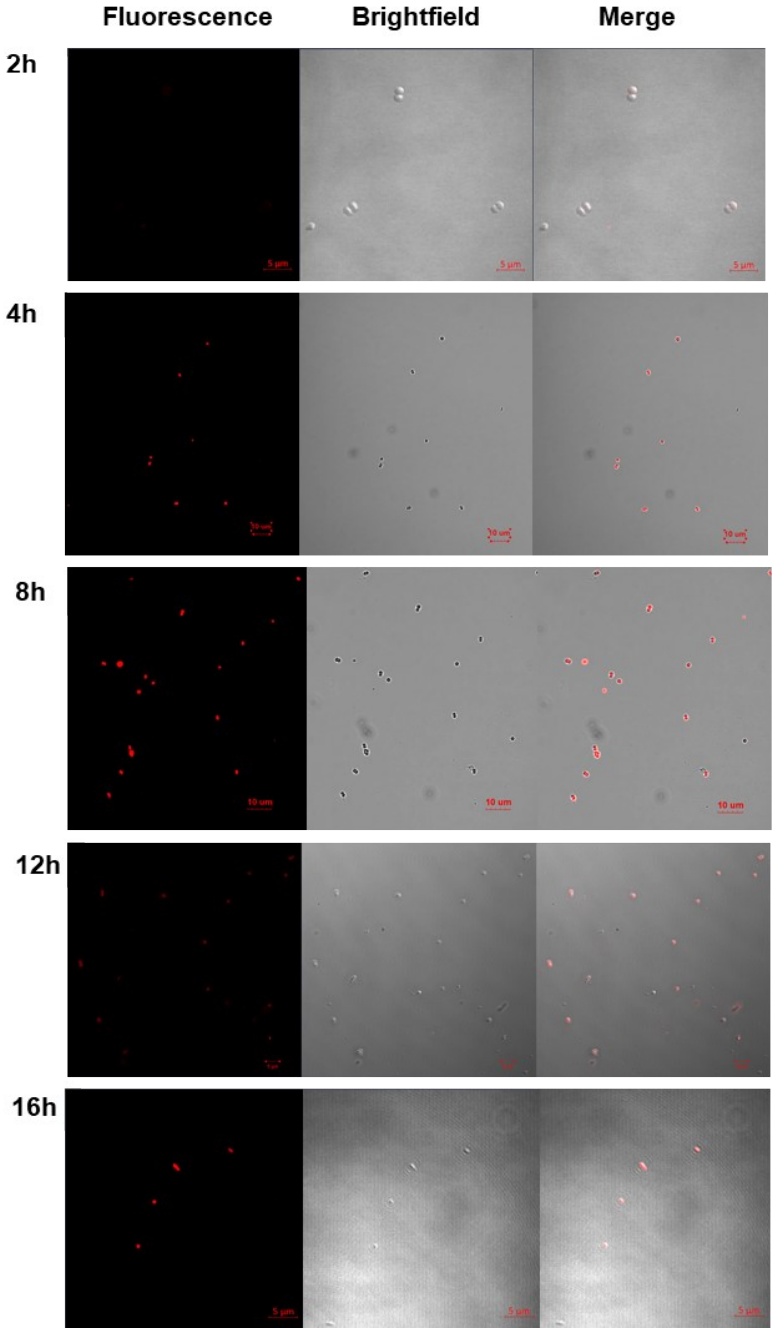

Fig. S4. Time-dependent binding of QNBPs with *S. aureus* cells. The *S. aureus* culture was collected at different time intervals (2, 4, 8, 12 and 16 h) and incubated with QNBPs, followed by imaging with a confocal microscope.

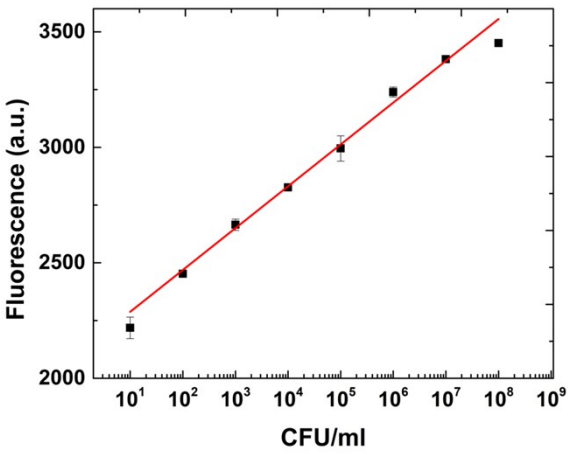

Fig. S5. The fluorescent intensity in relation to the *S. aureus* bacterial count. *S. aureus* cultures with different cell counts were incubated with QNBPs, and the fluorescence intensity was measured. The analysis revealed that the coefficient of determination (R^2) was 0.988. The error bar represents ± SEM.

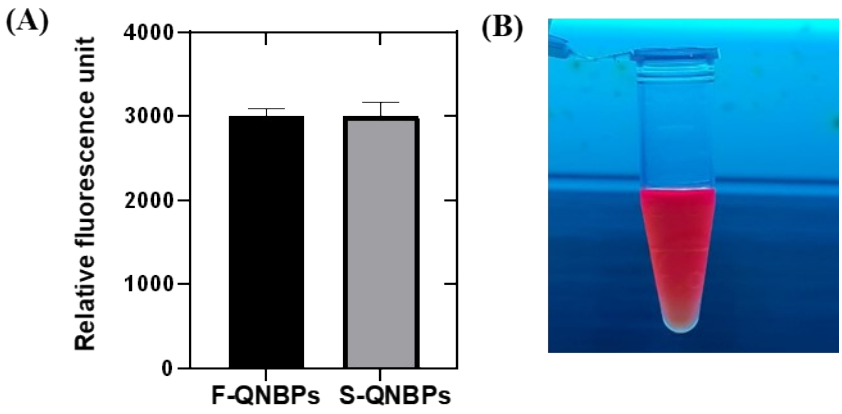

Fig. S6. The stability of QNBPs. (A) The binding comparison of freshly prepared QNBPs (F-QNBPs) and stored QNBPs (S-QNBPs). (B) The QNBPs solution was stored for up to a month under UV light. No visible aggregation was observed.

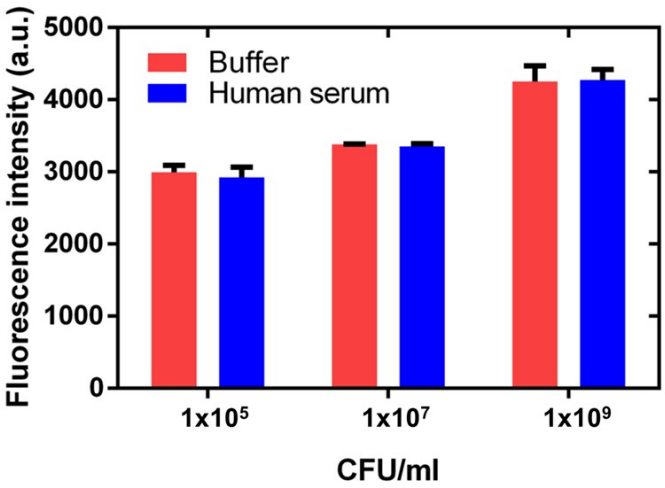

Fig. S7. The comparison between buffer solution and human serum for *S. aureus* labeling and fluorescence-based quantification. The *S. aureus* cells at multiple concentrations were used to test the binding of QNBPs in two different media.

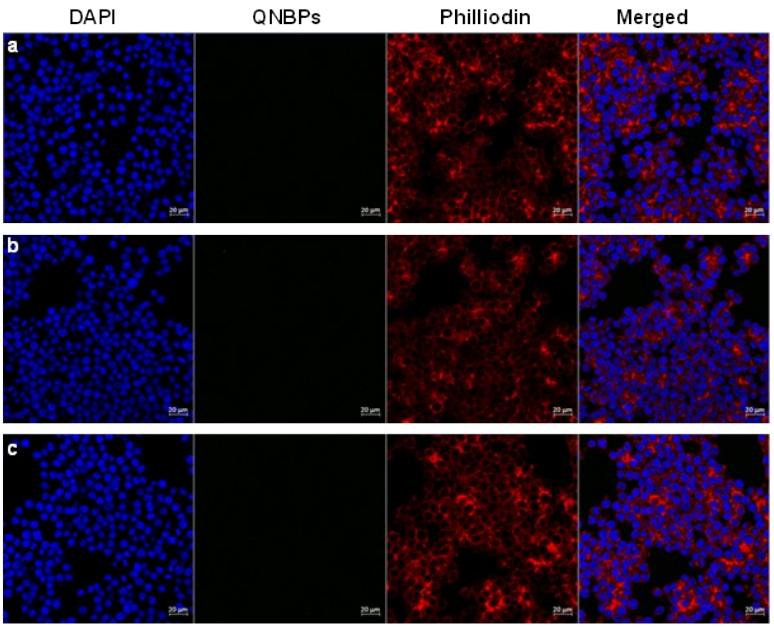

Fig. S8. Analysis of QNBP uptake by RAW264.7 cells. **(A)** RAW264.7 cells grown without QNBPs as the control and stained with rhodamine-phalloidin and DAPI. To evaluate the interaction between immune cells and the developed probe, the macrophages were treated with either 0.04 nM or (**B**) a two-fold increased concentration of QNBPs. (**C**) Fluorescence images were acquired 12 h later. As can be seen, the tested concentrations did not interact with macrophage cells.

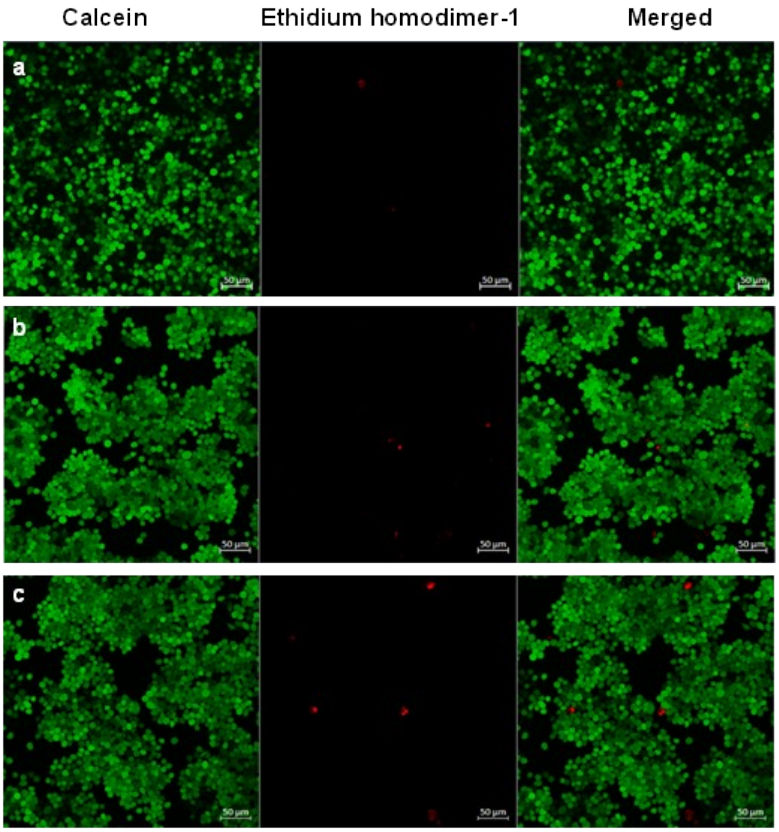

Fig. S9. The Live/Dead cell viability assay of RAW264.7 cells treated with QNBPs. The murine macrophage cells were incubated with calcein-AM and ethidium homodimer-1 and subsequently imaged with confocal microscopy to assess the cytotoxic effects of the QNBPs. (**A)** The cell culture that did not receive QNBPs and (**B)** the culture treated with the *in vivo*–tested concentration of 0.04 nM and **(C)** a two-fold increased concentration of QNBPs.

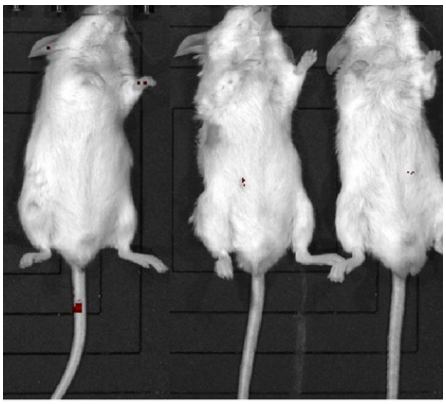

Fig. S10. The in-vivo micrographs of uninfected animals incubated with QNBPs. No significant signals from QNBPs were observed *in-vivo*.

Table 1. List of primers used in this study.

Gene	Primers	
agr-I	F	5′-CAC TTA TCA TCA AAG AGC C-3′
	R	5′-CCA CTA ATT ATA GCT GG-3′
agr-II	F	5′-GTA GAG CCG TAT TGA TTC C-3′
	R	5′-GTA TTT CAT CTC TTT AAG G-3′
agr-III	F	5′-CTG CAT TTA TTA GTG GAA TAC G-3′
	R	5′-GTT TCA TTT CTT TAA GAG-3′
agr-IV	F	5′-CAC TTA TCA TCA AAG AGC C-3′
	R	5′-GTA TTT CAT CTC TTT AAG G -3′