Supplementary Information

A fluorescent biosensor based on boronic acid functionalized carbon dots for identification and sensitive detection of Gram-positive bacteria

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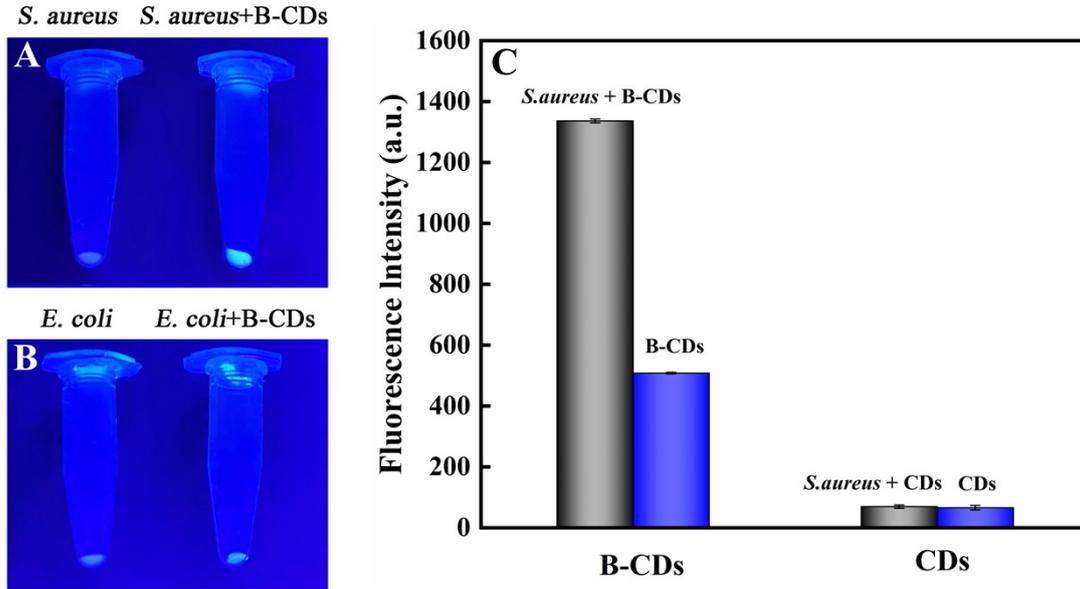Phone: 86-29-85310517, Fax: 86-29-85310517

Fig. S1 Photographs of *S. aureus*(A) and *E. coli* cell pellets (B) before and after B-CDs treatment under 365 nm UV light; (C) Comparison of the ability of B-CDs and e-CDs to recognize *S. aureus*.
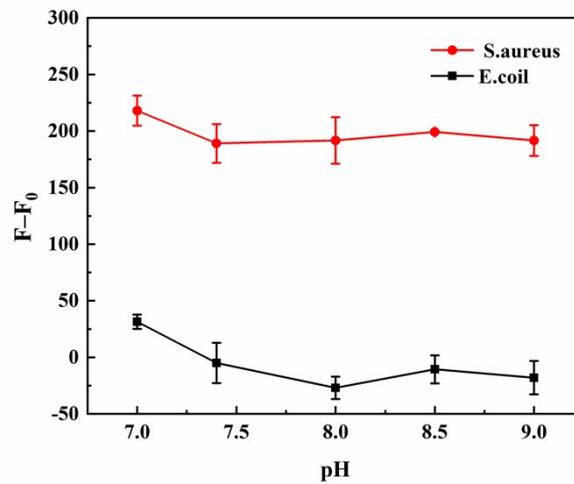

Fig. S2 The ability of B-CDs to recognize *S. aureus and E. coli* in different pH environment.

To investigate the effect of B-CDs on the recognition of Gram-positive bacteria in common pH environment, the fluorescence intensity of the precipitated resuspension was measured by incubating B-CDs with the same concentrations of *S. aureus* and *E. coli* at pH 7.0-9.0, respectively. Results in Fig. S2 demonstrated that pH environment had no significant influence on the recognition of B-CDs to Gram-positive bacteria.
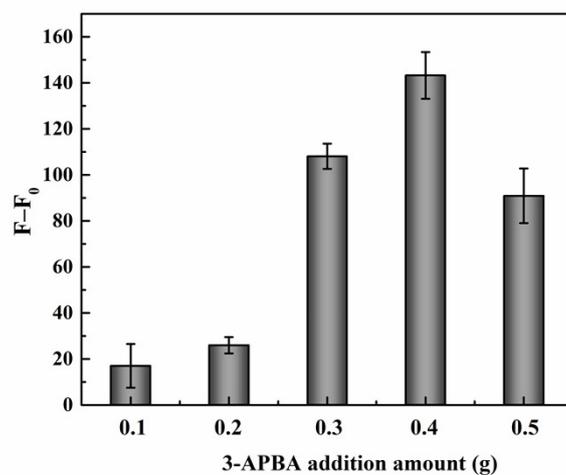
Fig. S3 The effect of different dosage of precursor substance (3-APBA)
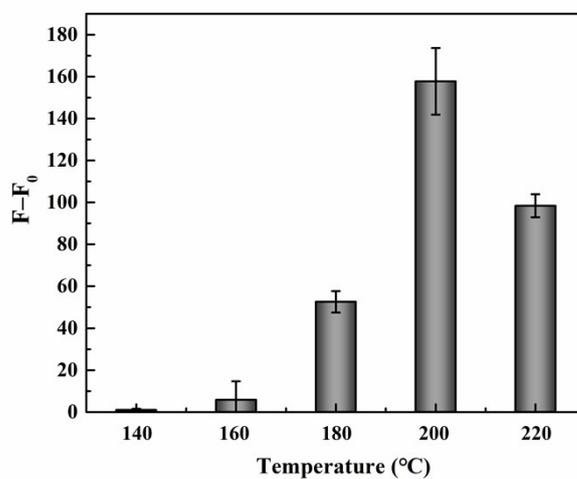
on the ability to detect *S. aureus*.

Fig. S4 The effect of B-CDs synthesis temperature on its ability to detect
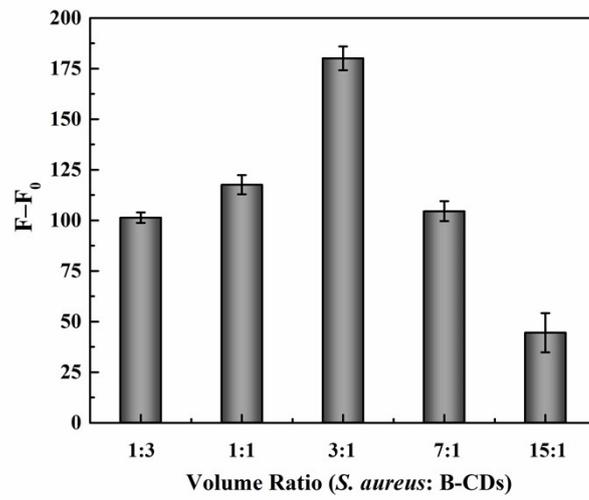
S. aureus.

Fig. S5 Influence of the mixed volume ratio of bacterial suspension and B-CDs on the detection effect.
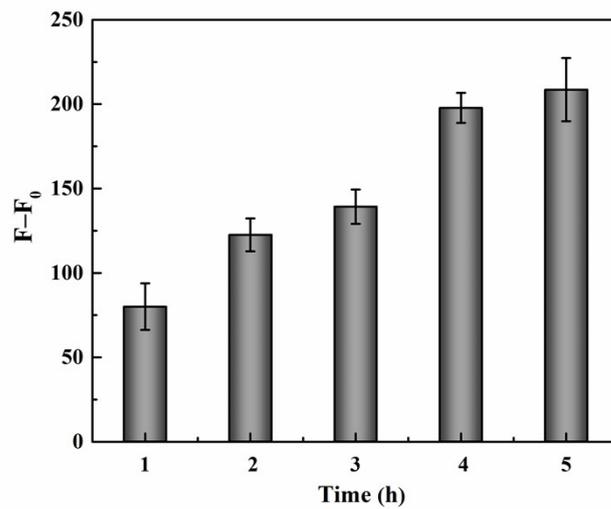

Fig. S6 Influence of the incubation time of bacterial suspension with B-CDs on the detection effect.

Table S1 Comparison of the developed biosensor with other reported methods for the determination of *S. aureus*.

Detection method	Linear Range (CFU/mL)	LOD (CFU/mL)	Reference
Immunochromatographic assay	$10^2-\times10^6$	10^2	1
Colorimetric assay	$10-10^6$	10	2
Electrochemical assay	10^1-10^7	10	3
Fluorescence method	$5.6\times10^1-5.6\times10^6$	22	4
Fluorescence method	10^4-10^8	2.24×10^2	5
Fluorescence method	$2.7\times10^2-2.7\times10^6$	2.7×10^2	6
Fluorescence method	$10-10^6$	10	7
Fluorescence method	$2.6\times10^1-5.2\times10^6$	7	This work

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