Supporting Information

Double-site recognition of Staphylococcus aureus using metal-organic frameworks material with alkaline hydrolysis property as a sensitive fluorescent probe

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Reagents and materials

$\text{AlCl}_3\cdot6\text{H}_2\text{O}$ and DMF were both provided by Huaweiruike Chemical (China). NH$_2$-H$_2$BDC was provided by Sigma-Aldrich (USA). FITC, EDC and NHS were all gained from Aladdin (China). Carboxylated MBs with a diameter of 3 $\mu$m were obtained from Biospes (China). BSA was gained from Leagene (China). Strains of *P. vulgaris*, *S. castellani*, *V. parahemolyticus*, *S. aureus* and *L. monocytogenes* were all gained from China Center for Type Culture Collection (China). Strains of *E. faecium* was gained from Guangdong Microbiology Culture Center (China). Dialysis cassette with MWCO of 1000 Da was gained from Thermo Fisher Scientific (USA). Polystyrene 96-well black microplates were obtained from Corning (USA). Pomegranate green tea and milk was gained from a local market. Glucose injection was gained from a local hospital. Saliva sample was collected from a healthy female volunteer.

Instrumentations

FL signals were collected using a F-7000 FL spectrophotometer (Hitachi, Japan). TEMs of MOFs NH$_2$-MIL-53(Al) and NH$_2$-MIL 53(Al)@TEI were obtained using a JEM 1200EX transmission electron microscope (JEOL, Japan). XRD pattern of MOFs NH$_2$-MIL-53(Al) was obtained using a D8 ADVANCE X-ray powder diffractometer (Bruker, Germany). XPS patterns of MOFs NH$_2$-MIL-53(Al) and NH$_2$-MIL 53(Al)@TEI were obtained using an Escalab 250Xi XPS spectrometer (Thermo Fisher Scientific, USA). FL imaging of stained bacterial cells were conducted on a Ni-U FL microscope (Nikon Instruments Co., Ltd., Japan). UV-vis absorption spectra of MOFs NH$_2$-MIL-53(Al), hydrolyzed MOFs NH$_2$-MIL-53(Al) and NH$_2$·H$_2$BDC were measured using an
Infinite 200 microplate reader (Tecan, Austria). SEMs of NH$_2$-MIL-53(Al)@TEI incubated with \textit{S. aureus}, MBs-pig IgG incubated with \textit{S. aureus}, as well as NH$_2$-MIL-53(Al)@TEI and MBs-pig IgG incubated with \textit{S. aureus} were obtained using a JSM-7100F thermal field emission scanning electron microscope (JEOL, Japan).
Figure S1. (a) TEM of MOFs NH$_2$-MIL-53(Al). (b) TEM of NH$_2$-MIL 53(Al)@TEI. (c) XPS patterns of MOFs NH$_2$-MIL-53(Al) and NH$_2$-MIL-53(Al)@TEI. (d) XRD pattern of MOFs NH$_2$-MIL-53(Al).
Figure S2. (a) TEM of hydrolyzed MOFs NH$_2$-MIL-53(Al). (b) FL emission spectra of MOFs NH$_2$-MIL-53(Al) (blue), hydrolyzed MOFs NH$_2$-MIL-53(Al) (red) and NH$_2$·H$_2$BDC (black). The concentration of MOFs NH$_2$-MIL-53(Al) and NH$_2$·H$_2$BDC was 50 ng mL$^{-1}$. (c) UV-vis absorption spectra of MOFs NH$_2$-MIL-53(Al) (blue), hydrolyzed MOFs NH$_2$-MIL-53(Al) (black) and NH$_2$·H$_2$BDC (red). The concentration of MOFs NH$_2$-MIL-53(Al) and NH$_2$·H$_2$BDC was 500 μg mL$^{-1}$, the concentration of NH$_2$·H$_2$BDC was 100 μg mL$^{-1}$. 