Supporting Information

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

Junyi Wei, Lvxia Zhang, Hongling Yang, Lin Wang, and Zhifeng Fu*

Key Laboratory of Luminescence Analysis and Molecular Sensing (Ministry of Education), College of Pharmaceutical Sciences, Southwest University, Chongqing 400716, China

* Corresponding author.

E-mail address: fuzf@swu.edu.cn

Reagents and materials

$AlCl_3 \cdot 6H_2O$ and DMF were both provided by Huaweiruike Chemical (China). NH_2-H_2BDC was provided by Sigma-Aldrich (USA). FITC, EDC and NHS were all gained from Aladdin (China). Carboxylated MBs with a diameter of 3 μm 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 $NH_2 \cdot H_2BDC$ were measured using an

Infinite 200 microplate reader (Tecan, Austria). SEMs of NH_2-MIL-53(Al)@TEI incubated with *S. aureus*, MBs-pig IgG incubated with *S. aureus*, as well as NH_2-MIL-53(Al)@TEI and MBs-pig IgG incubated with *S. aureus* were obtained using a JSM-7100F thermal field emission scanning electron microscope (JEOL, Japan).

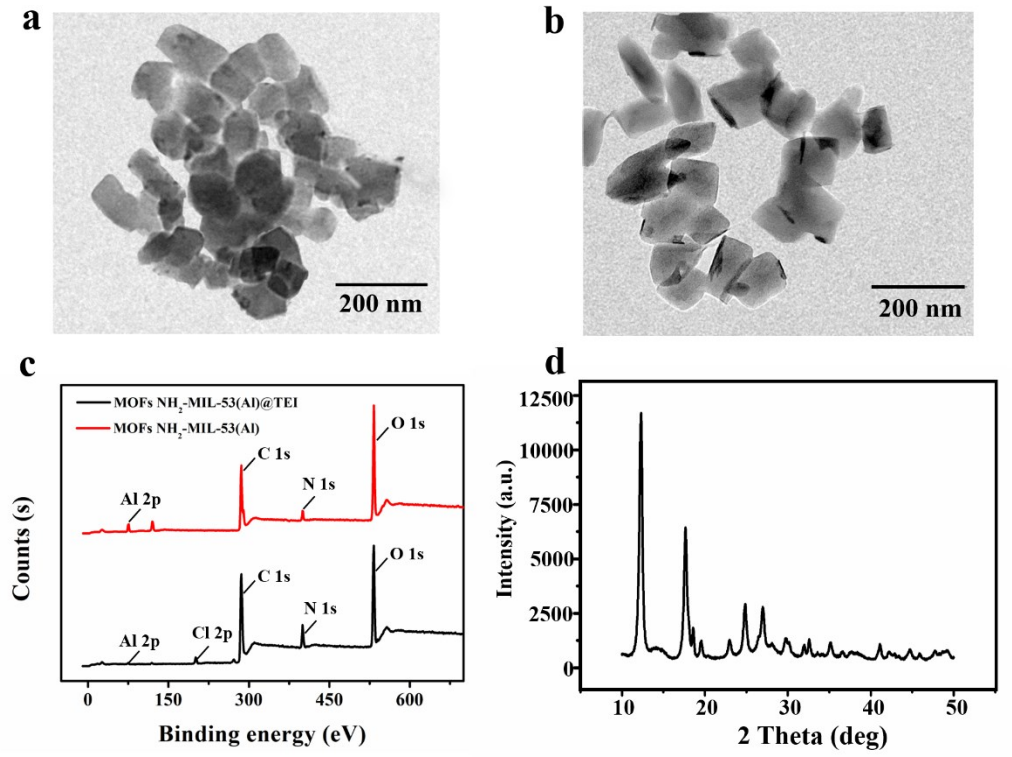

Figure S1. (a) TEM of MOFs NH_2-MIL-53(Al). (b) TEM of NH_2-MIL 53(Al)@TEI. (c) XPS patterns of MOFs NH_2-MIL-53(Al) and NH_2-MIL-53(Al)@TEI. (d) XRD pattern of MOFs NH_2-MIL-53(Al).

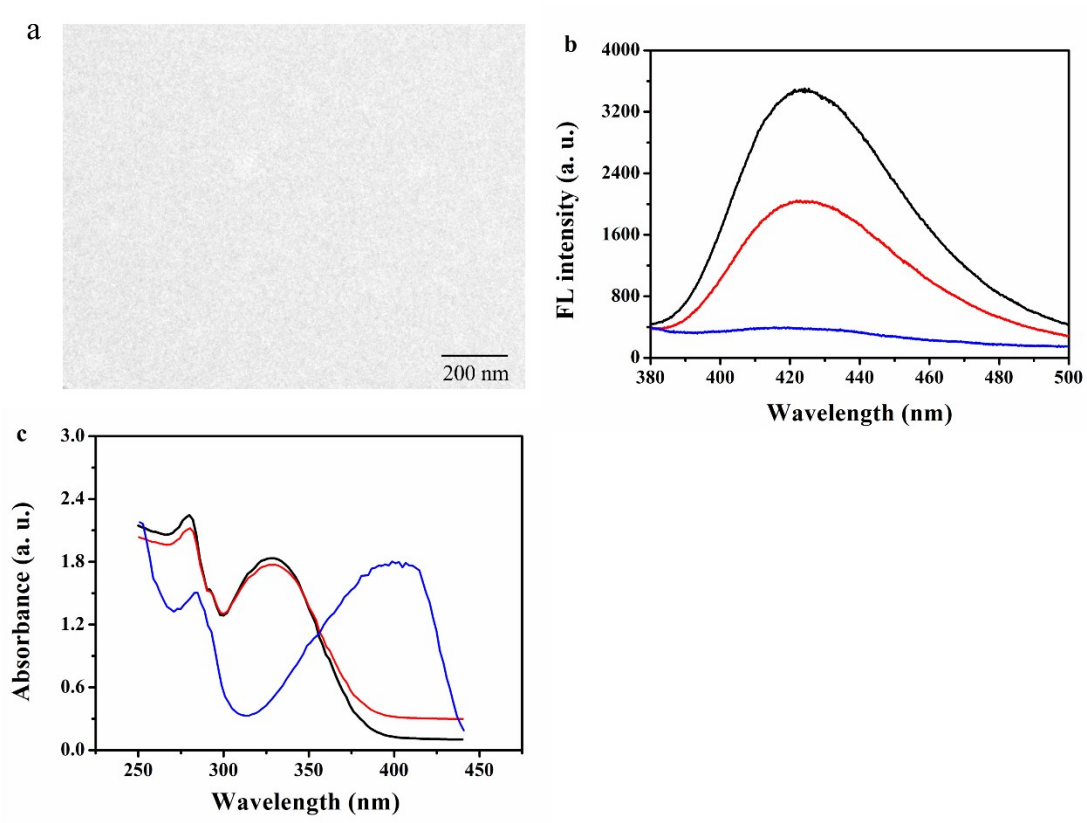

Figure S2. (a) TEM of hydrolyzed MOFs NH_2-MIL-53(Al). (b) FL emission spectra of MOFs NH_2-MIL-53(Al) (blue), hydrolyzed MOFs NH_2-MIL-53(Al) (red) and $NH_2 \cdot H_2BDC$ (black). The concentration of MOFs NH_2-MIL-53(Al) and $NH_2 \cdot H_2BDC$ was 50 ng mL^{-1}. (c) UV-vis absorption spectra of MOFs NH_2-MIL-53(Al) (blue), hydrolyzed MOFs NH_2-MIL-53(Al) (black) and $NH_2 \cdot H_2BDC$ (red). The concentration of MOFs NH_2-MIL-53(Al) and $NH_2 \cdot H_2BDC$ was 500 μg mL^{-1}, the concentration of $NH_2 \cdot H_2BDC$ was 100 μg mL^{-1}.