Supplementary Material
New potential for boron-based COFs: the biocompatible COF-1 for reactive oxygen generation and antimicrobial applications

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Materials

1,4-Phenylenediboronic acid（BDBA，99.09%）was purchased from Shanghai Bidepharm Technology Co., Ltd. (3-aminopropyl) triethoxysilane (APTES) was bought from Shanghai yuanye Bio-Technology Co., Ltd. Mesitylene (98%) was purchased from Beijing inno-chem Technology Co., Ltd. Tetrahydrofuran (THF, AR), 1,4-dioxane (AR), acetone (AR) were acquired from Nanjing Chemical Reagent Co., Ltd. Propidium Iodide PI was obtained from Shanghai Xianhui Pharmaceutical Co., Ltd. 2.5% glutaraldehyde solution was provided by Nanjing Shenghang Biotechnology Co., Ltd. (China). Other chemical reagents were obtained from Aladdin Reagent Co., Ltd (Shanghai, China). E. coli and S.aureus culture medium (LB) was purchased from Beijing Luqiao Technology Co., Ltd. Coomassie Brilliant Blue and MTT kits were purchased from Beyotime. HEK293T cells were purchased from Purutin Biotechnology (Beijing) Co., Ltd. All

chemicals were used without further purification unless otherwise noted.

Synthesis procedure

Synthesis of pure COF-1.

100.0 mg(0.60mmol) of BDBA and 4 mL of a 1:1 v/v solution of mesitylene: 1,4-dioxane were charged into a glass tube. The reaction mixture was sonicated for 30 minutes, followed by the degassing procedure using freeze-pump-thaw cycles for three times. The glass tube was then flame-sealed and the mixture was sonicated for 60 minutes again and being heated at 120 °C in an oven for 72 h. After being collected by filtration, the precipitate was washed with 1,4-dioxane and acetone. Pure COF-1 was obtained as a pure white powder (62.5 mg, 62.5% yield).

Result and discussion

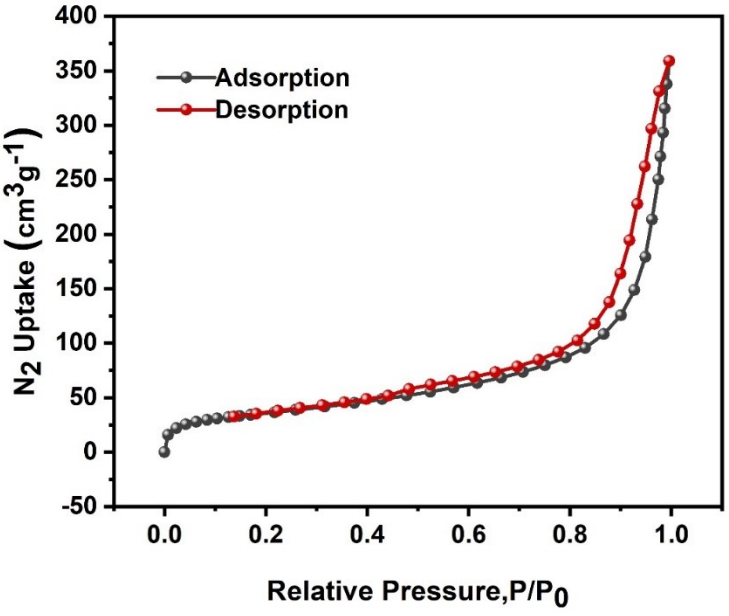

Figure S1. N_2 sorption isotherm at 77 K of COF-1. S_{BET}=130m^2/g

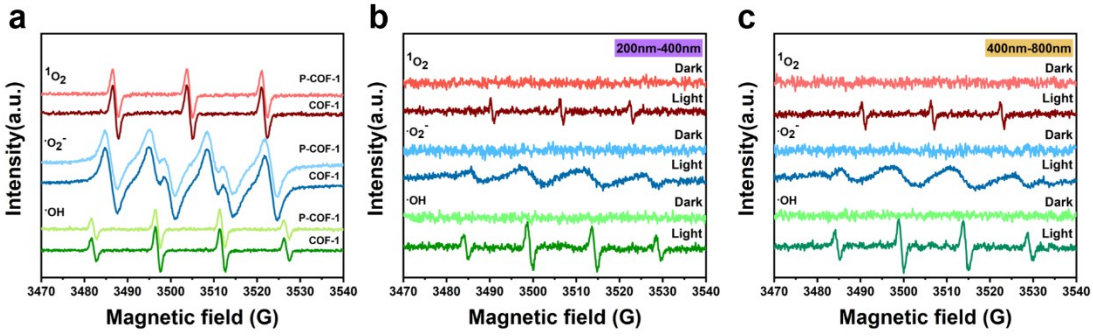

Figure S2. (a)EPR spectra of $^1O_2$,$\bullet O_2^-$ and •OH produced by P-COF-1(without APTES) under light condition compared to COF-1; Photocatalytic activity of COF-1 in ultraviolet(b) and visible regions(c).

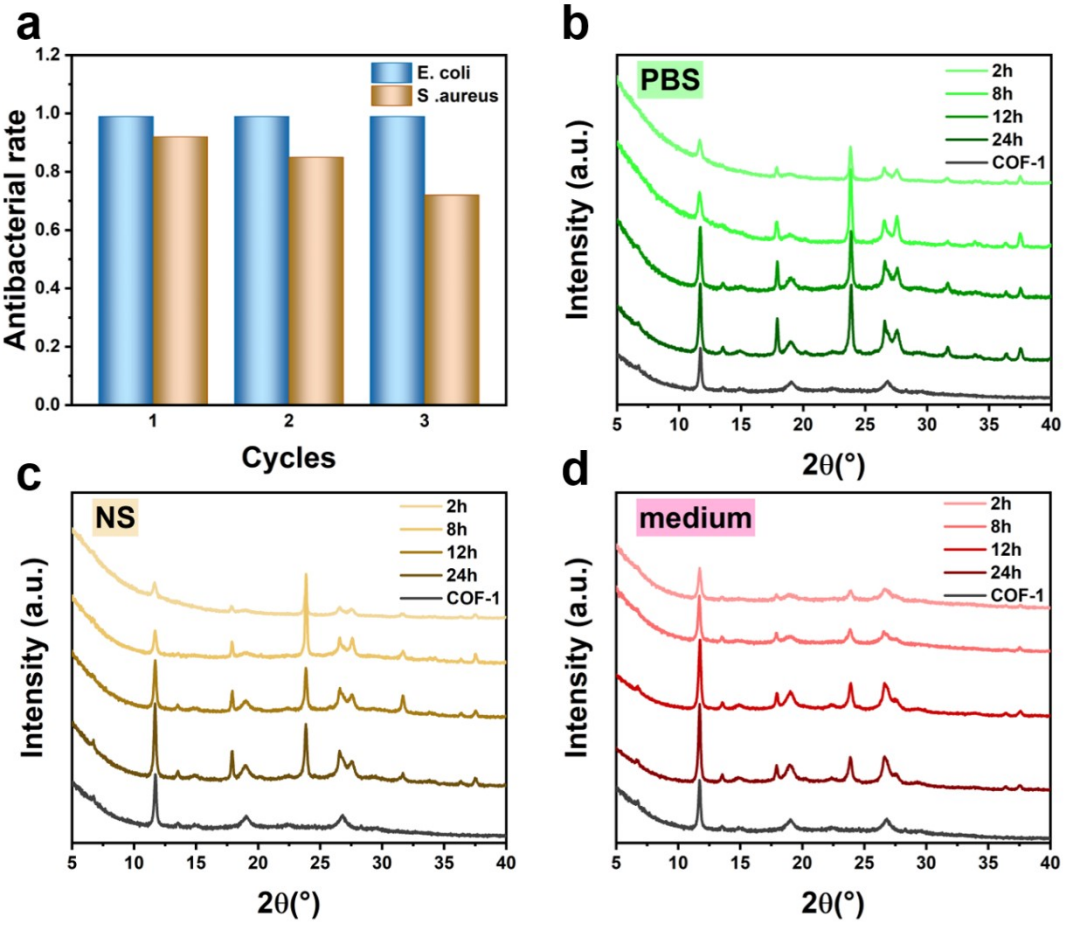

Figure S3. (a) Circulating antibacterial effect of two kinds of bacteria; Stability of COF-1 in PBS buffer(b), normal saline(c) and culture medium(d).

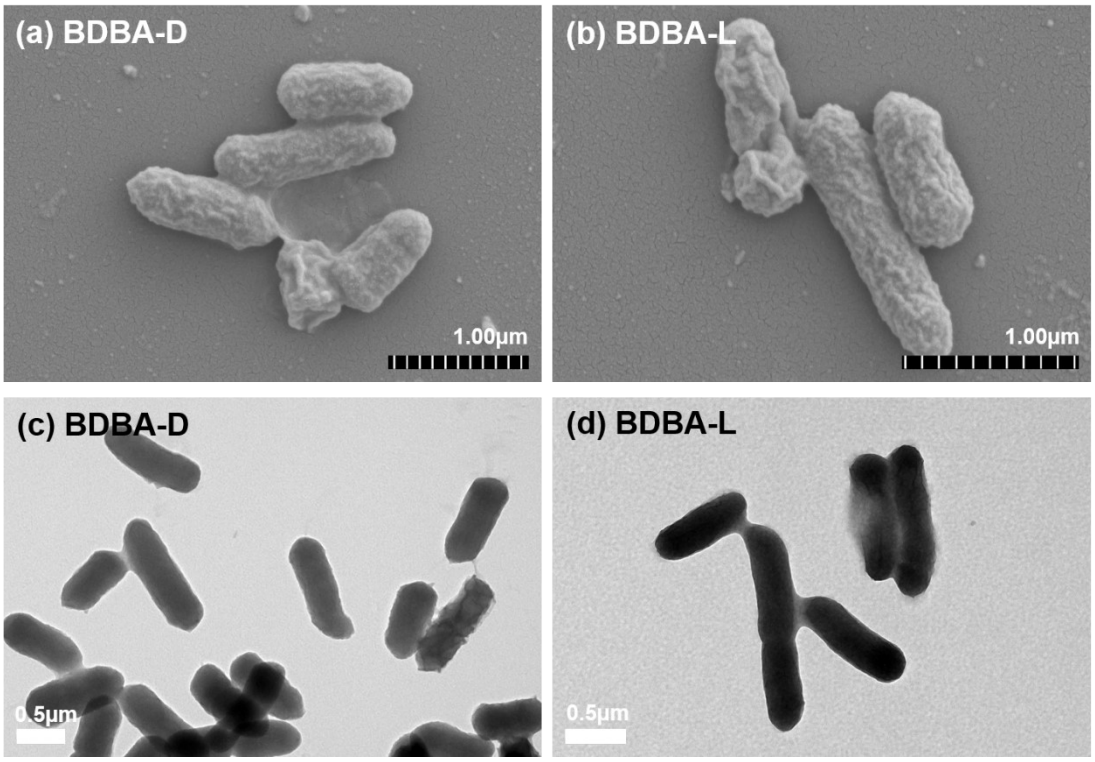

Figure S4. The SEM and TEM images of the morphologies of E. coli treated by BDBA under dark (a) (c) and light (b) (d) conditions;

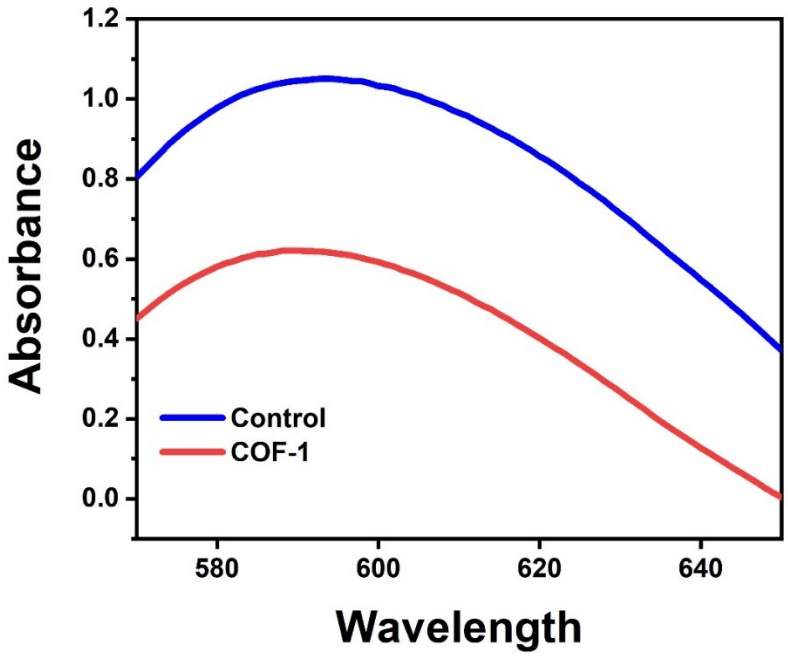

Figure S5. Percentage of protein degradation for COF-1.

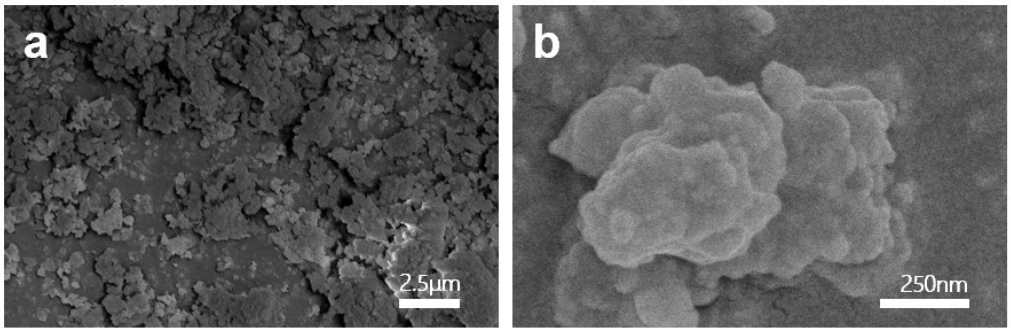

Figure S6. SEM images of COF-1.

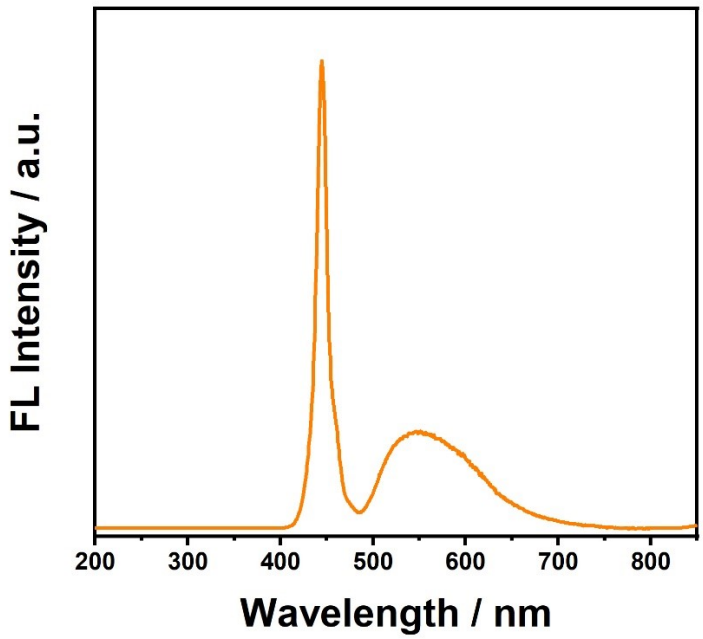

Figure S7. Spectroscopic analysis of LED used in antibacterial experiment