

## Electronic Supplementary Information

# A Metal-Organic Framework Based Inner Ear Delivery System for the Treatment of Noise-Induced Hearing Loss

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## **Section S1. Methods and experimental procedures**

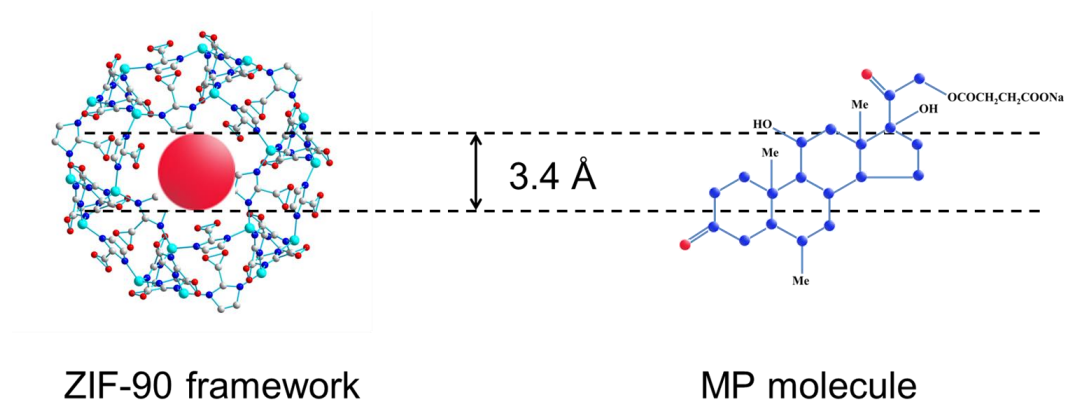
### ***Synthesis of in vitro release of MP@ZIF-90***

In a typical experiment, 10 mg of MP@ZIF-90 was suspended in a 20.0 mL, pH 7.4 PBS at 37 °C for 7 days. Then, 0.5 M HCl was added to adjust the pH to 5. The release amount of each time point is operated by taking 0.5 mL of solution in tube and injected to RP-HPLC. The amount of MP was determined from the absorbance at 254 nm. The release percentages of MP were calculated by the equation: release percentage (%) =  $m(\text{MP}_{\text{released}})/m(\text{MP}_{\text{total}})$ .

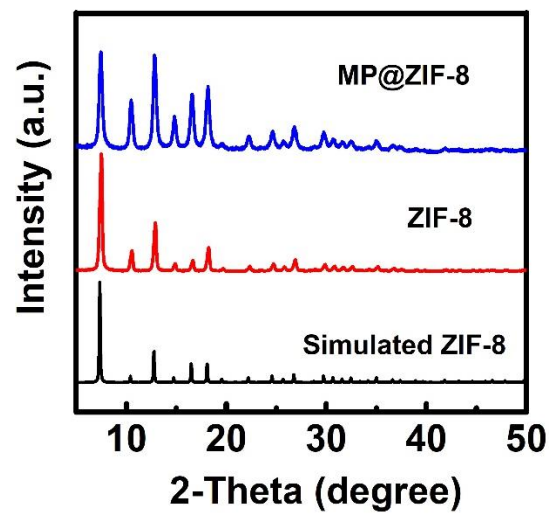
### ***MTT assays in breast cancer cells***

MCF-7 cells were seeded into 96-well plates at  $1 \times 10^6$  cells per well. Then, these cells were cultured in media with 10% fetal calf serum. The ZIF-90, or ZIF-8 NPs were added at designed concentrations and incubated at 37 °C for 48 h. 10 mL of 3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) was added to each well. The cells were further incubated for 4 h. The medium was removed. Then, DMSO was added. The values were collected at 570 nm with a plate reader.

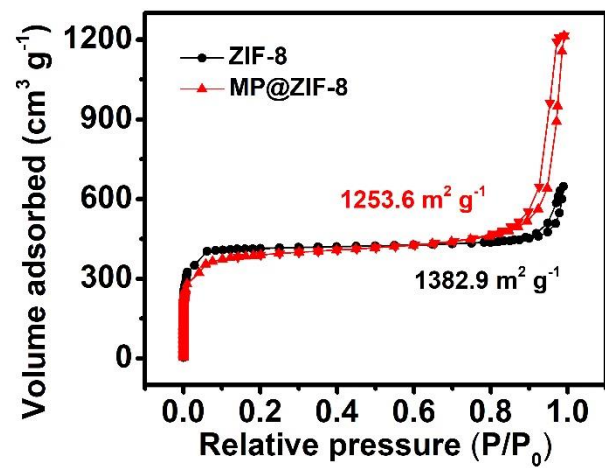
## Section S2. Characterization of the materials



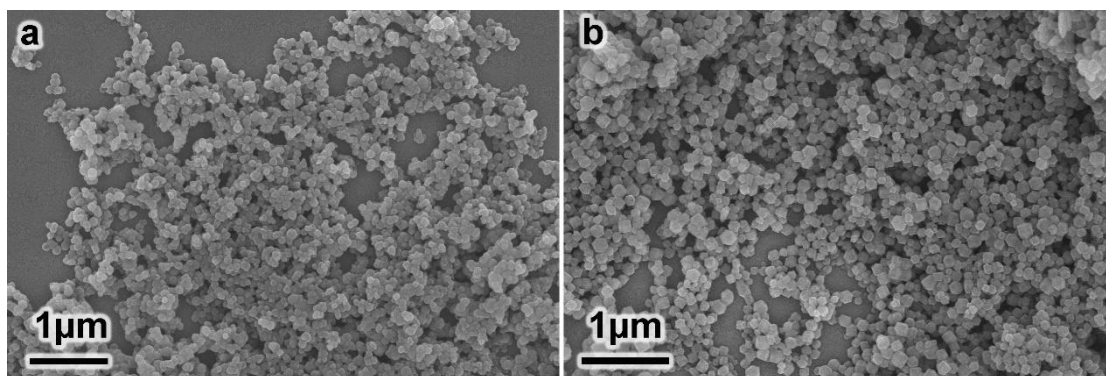
**Figure S1.** The comparison of the molecular size of MP molecule and the size of pore aperture of ZIF-90 framework.



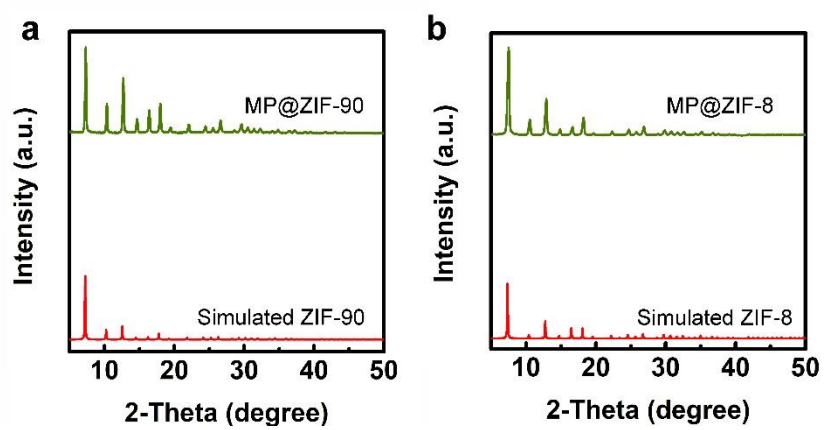
**Figure S2.** PXRD patterns of ZIF-8 and MP@ZIF-8.



**Figure S3.** N<sub>2</sub> adsorption/desorption isotherms of ZIF-8 and MP@ZIF-8.



**Figure S4.** SEM images of FITC@ZIF-90 (a) and FITC@ZIF-8 (b).



**Figure S5.** PXRD patterns of FITC@ZIF-90 (a) and FITC@ZIF-8 (b).