Supplementary Information

Reusable Fluorescent Biosensor Based on Morphology-controlled ZIF-8⊃FAM-DNA film

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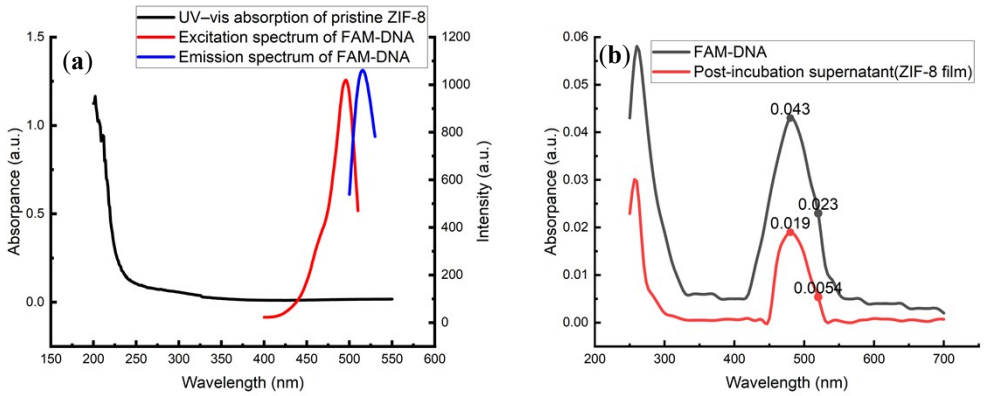

Fig. S1 UV–vis absorption and fluorescence spectra used to evaluate potential inner filter effects (IFE). (a) UV–vis absorption spectrum of pristine ZIF-8 (black) together with the excitation (red) and emission (blue) spectra of FAM-DNA. (b) UV–vis absorption spectra of FAM-DNA solution (black) and the post-incubation supernatant after contacting the ZIF-8 film (red). The absorbance at 480 nm and 520 nm is low (values are labeled in the figure), indicating a negligible IFE under the experimental conditions.

Supplementary Notes for the Fig. S1:

1. UV–vis spectra were recorded by using a 1 cm quartz cuvette with the corresponding buffer as blank. The post-incubation supernatant was collected after incubating the ZIF-8 film with FAM-DNA for 60 minutes and removing the film.

2. From Fig.S1, the absorbance at the excitation and emission wavelengths ($\lambda_{ex} = 480$ nm, $\lambda_{em} = 520$ nm) is low. For FAM-DNA, $A_{480} = 0.043$ and $A_{520} = 0.023$ (IFE factor is calculated to be 1.08 by the equation * MERGEFORMAT (S1). For the post-incubation supernatant, $A_{480} = 0.019$ and $A_{520} = 0.0054$ (IFE factor is 1.03). Thus, IFE would affect the fluorescence intensity by only 3~8%, whereas the observed quenching is 79.4%, indicating that IFE is negligible and cannot account for the pronounced quenching.

$$F_{corr} = F_{obs} \times 10^{\frac{A_{480}+A_{520}}{2}} \quad \text{* MERGEFORMAT (S1)}$$