Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting information

A 2-in-1 multi-functionalized sensor for efficient epinephrine detection based on cucurbit[7]uril functionalized lanthanide metal-organic framework and its intelligent application on molecular robot

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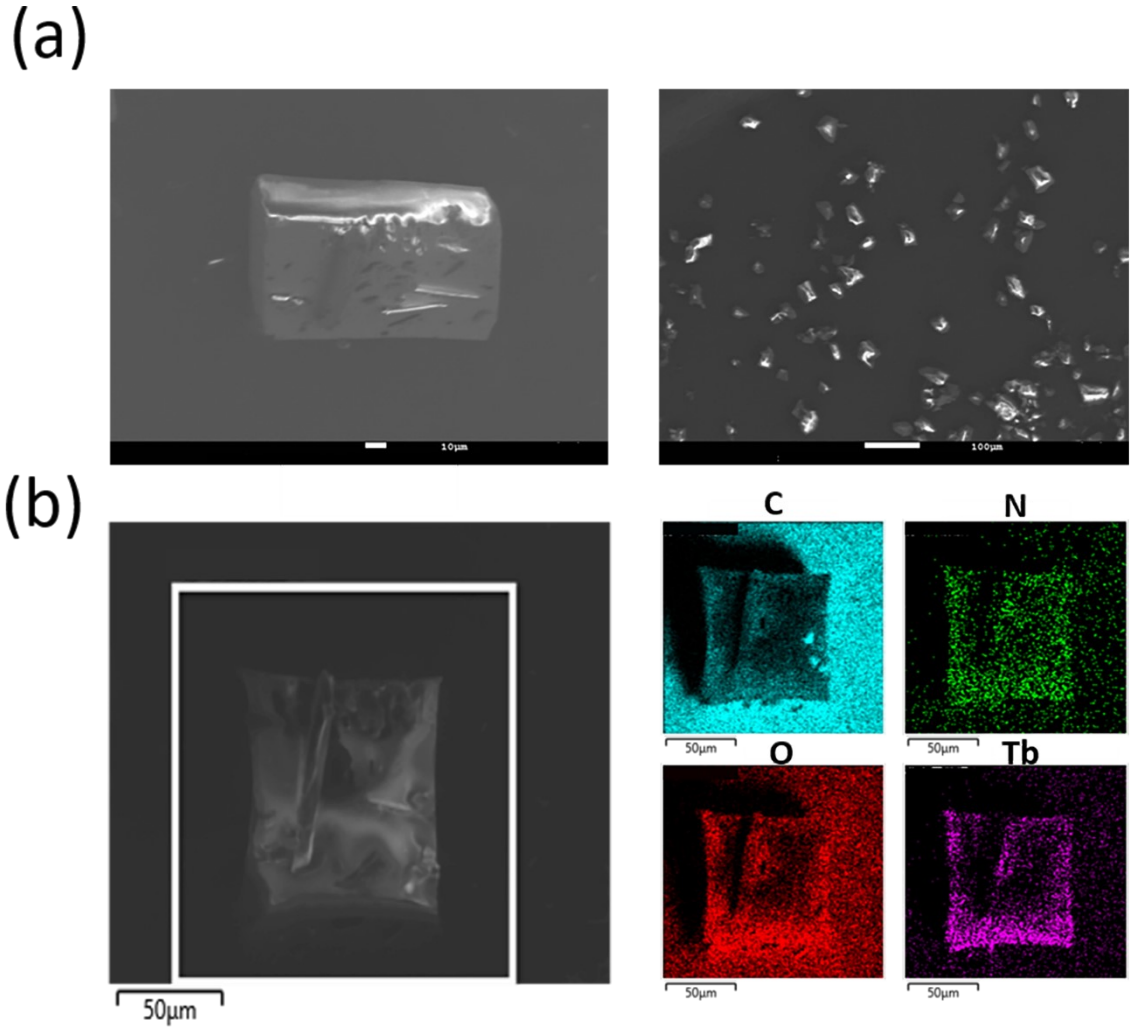

Figure S1 The (a) SEM image and (b) element mappings of TbMOFs.

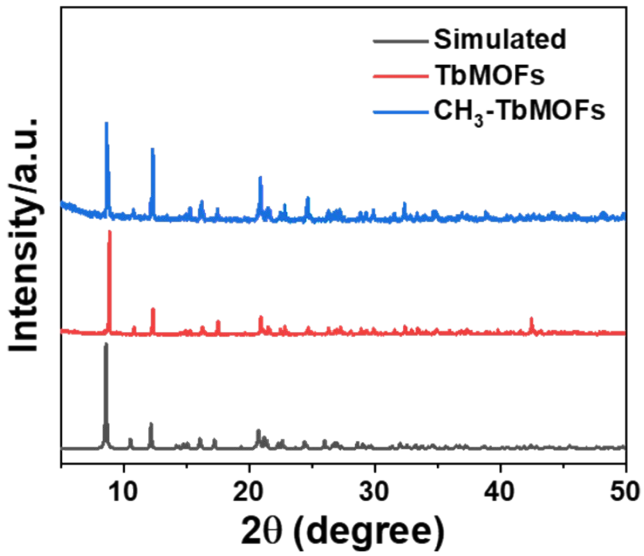

Figure S2 The PXRD patterns of TbMOFs and CH_3-TbMOFs.

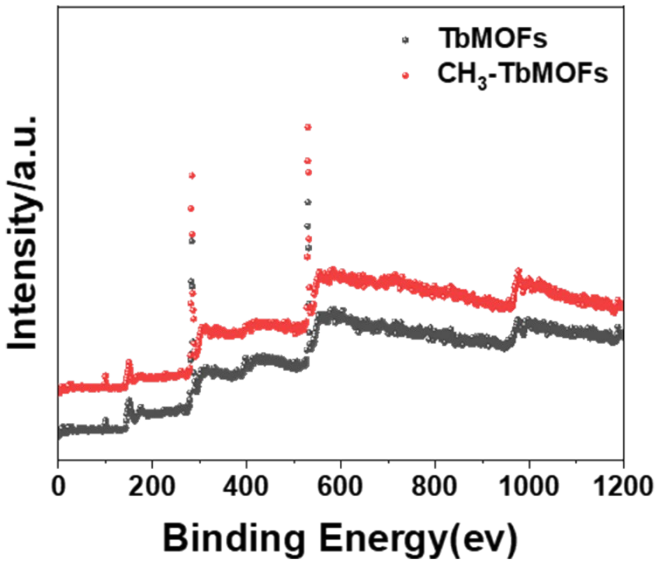

Figure S3 The XPS spectra of TbMOFs and CH_3-TbMOFs.

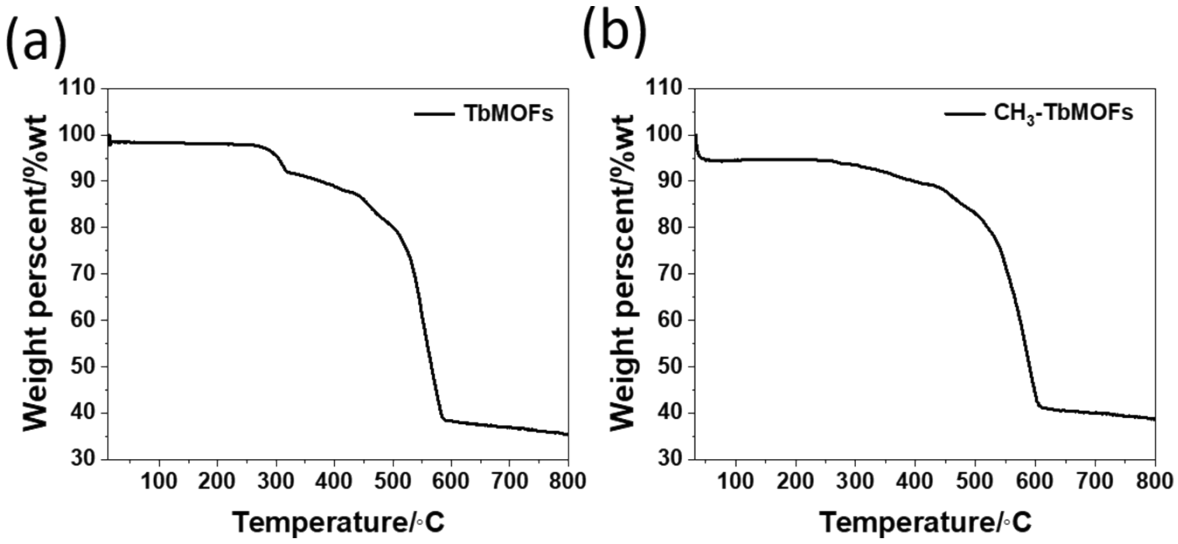

Figure S4 Thermal gravimetric analysis curves of (a) TbMOFs and (b) CH_3-TbMOFs.

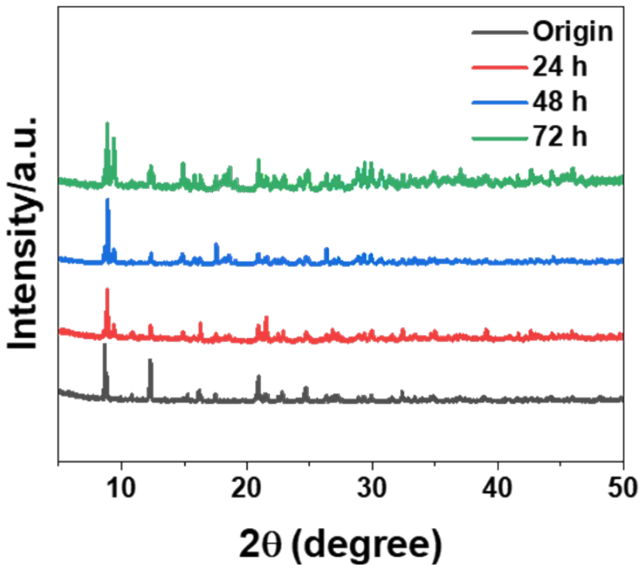

Figure S5 The PXRD patterns of TbMOFs after being immersed in the H_2O for 0-72h.

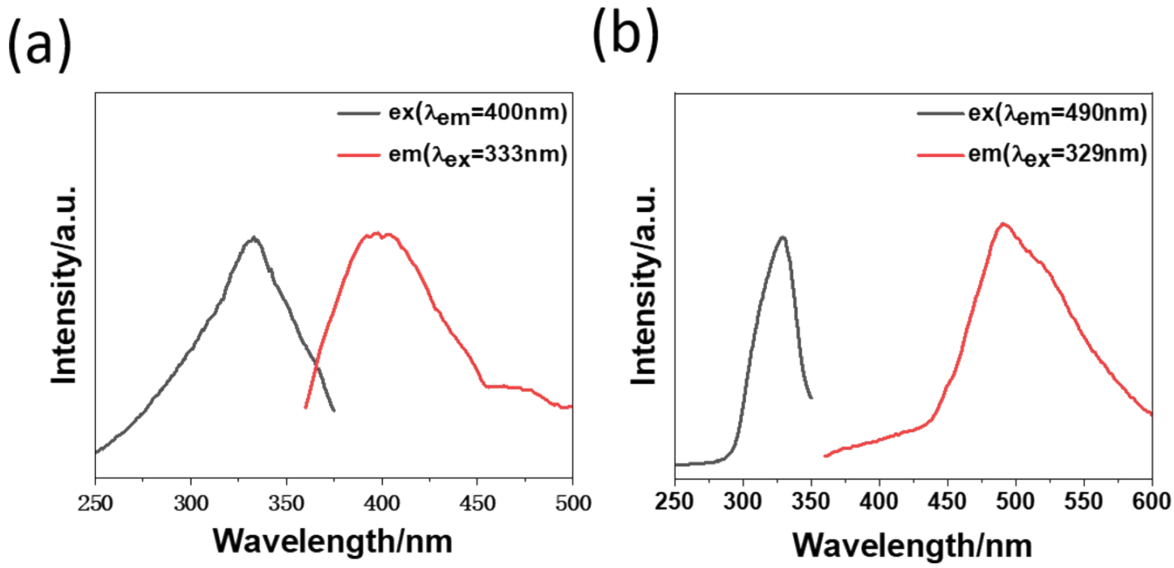

Figure S6 Excitation (black line) and emission (red line) spectra of (a) H_2bdc and (b) H_2bpydc.

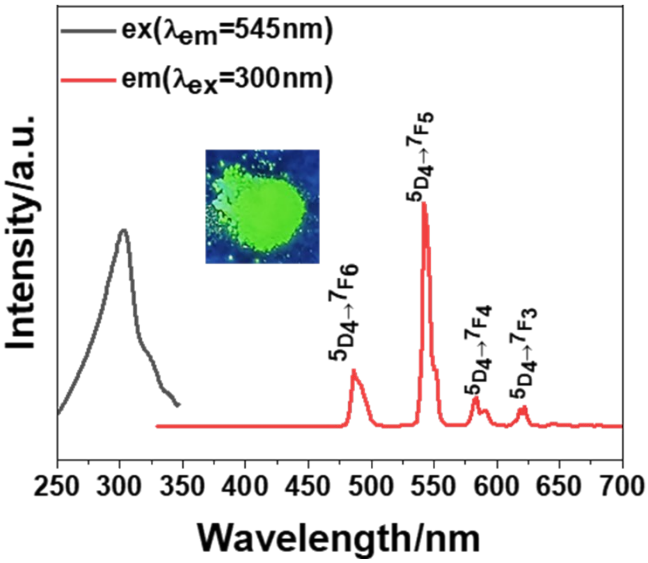

Figure S7 The excitation (black line) and emission (red line) spectra of TbMOFs in solid state (The inset is corresponding photograph under UV light).

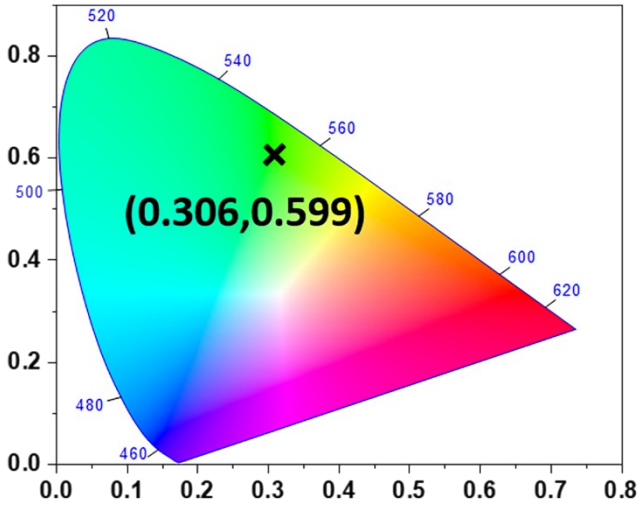

Figure S8 The corresponding CIE chromaticity diagram of TbMOFs.

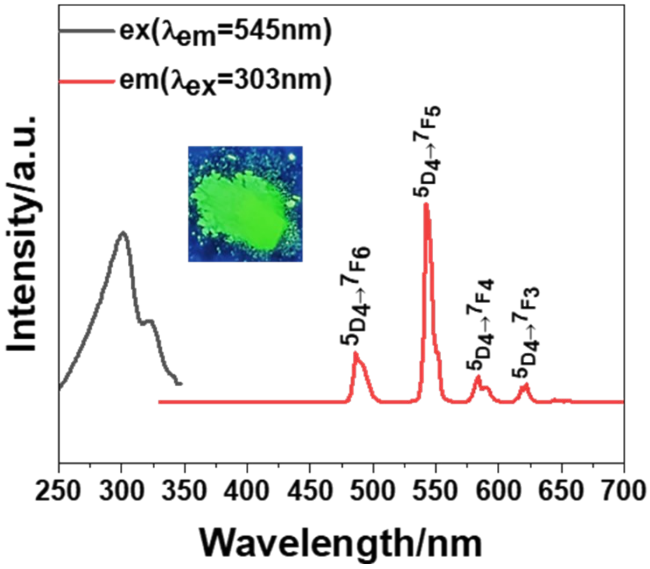

Figure S9 The excitation (black line) and emission (red line) spectra of CH_3-TbMOFs in solid state (The inset is corresponding photograph under UV light).

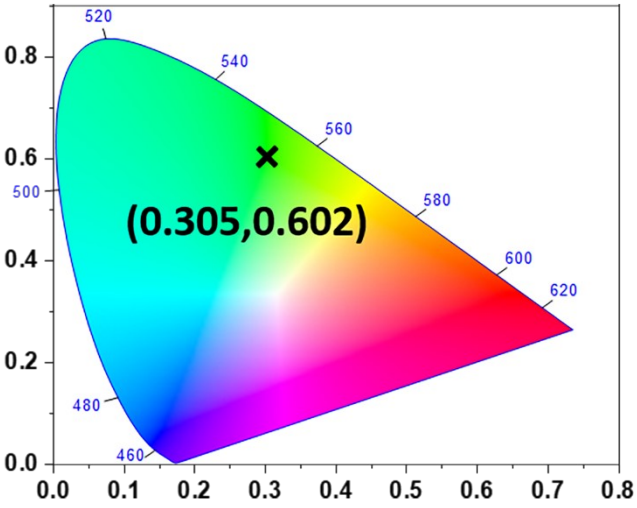

Figure S10 The corresponding CIE chromaticity diagram of CH_3-TbMOFs.

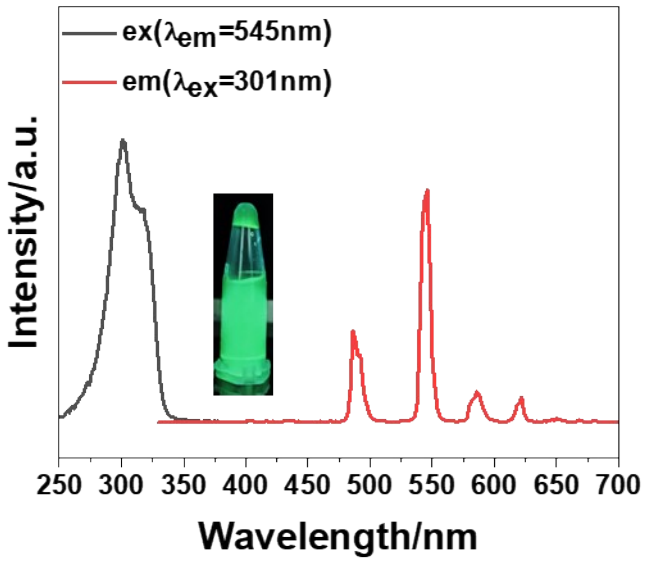

Figure S11 The excitation (black line) and emission (red line) spectra of CH_3-TbMOFs in aqueous environment.

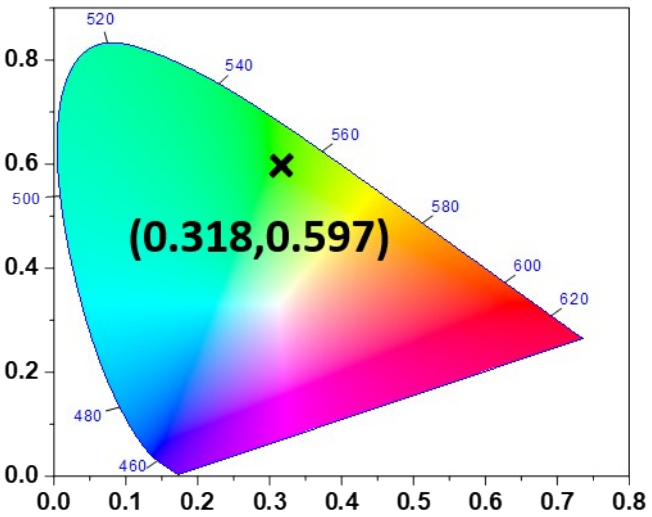

Figure S12 The corresponding CIE chromaticity diagram of CB@CH_3-TbMOFs.

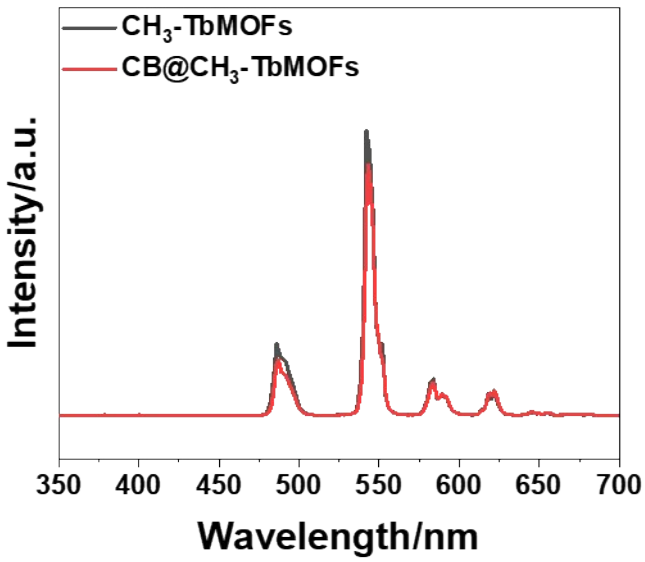

Figure S13 The emission spectra of CH_3-TbMOFs and CB@CH_3-TbMOFs.

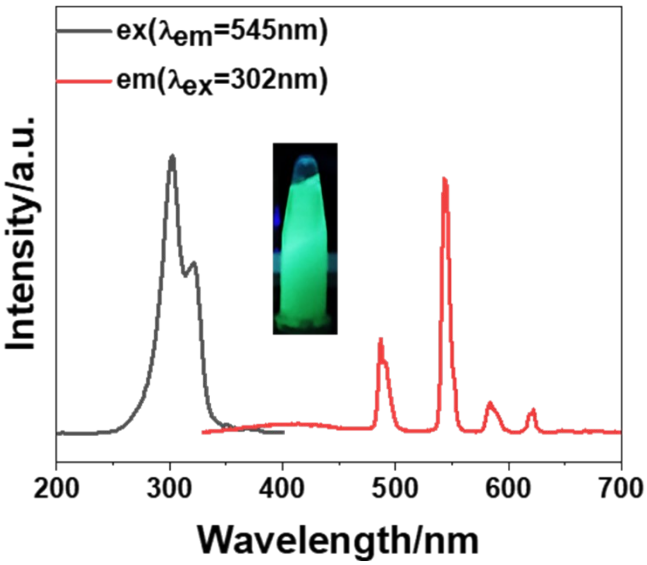

Figure S14 The excitation (black line) and emission (red line) spectra of CB@CH_3-TbMOFs in H_2O (The inset is corresponding photograph under UV light).

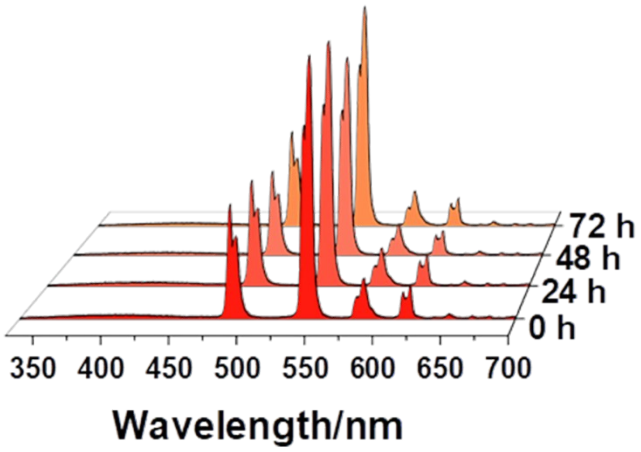

Figure S15 Day to day fluorescence stability of CB@CH_3-TbMOFs.

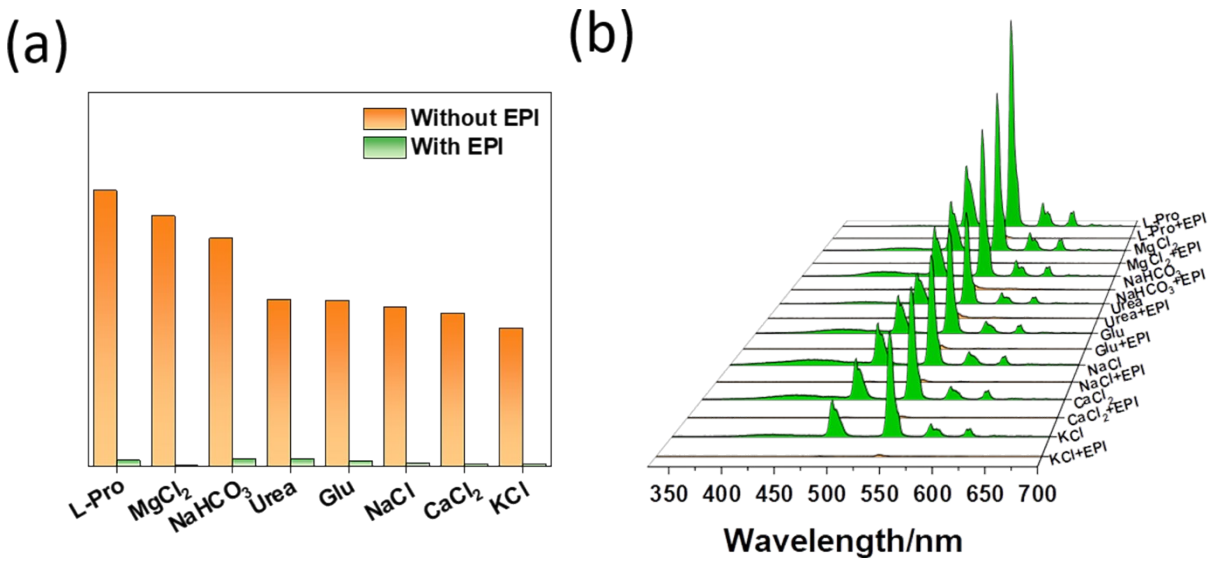

Figure S16 The (a) histogram and the (b) luminescence responses for the fluorescence of CB@CH_3-TbMOFs toward other serum components with and without EPI.

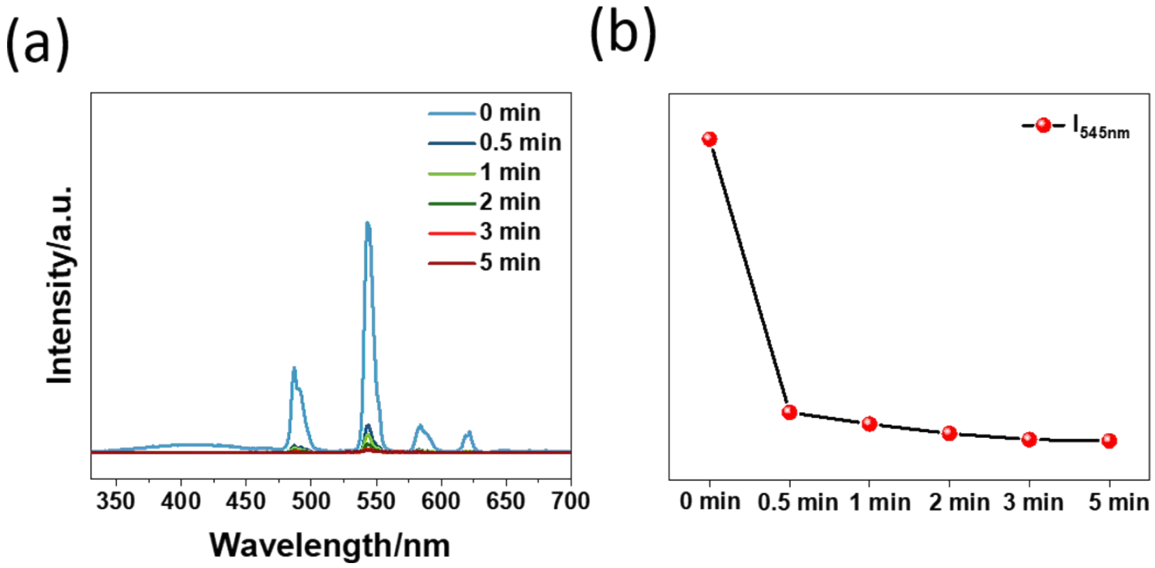

Figure S17 (a) Variation of luminescent intensity of CB@CH_3-TbMOFs with different immersion time in EPI; (b) The corresponding line chart.

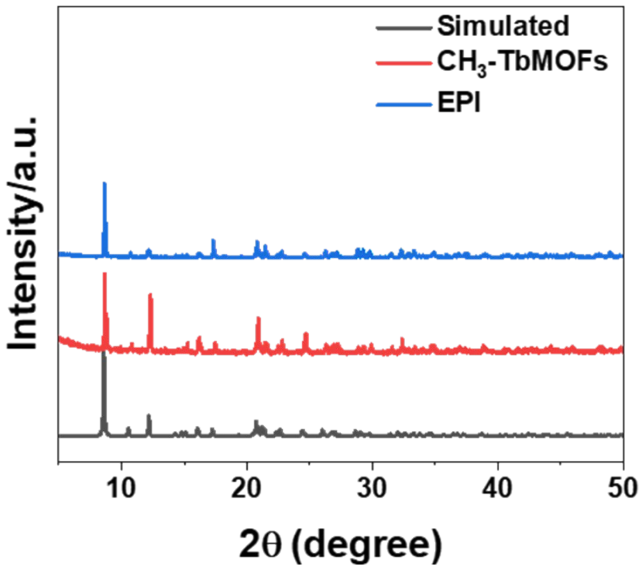

Figure S18 PXRD patterns of CH_3-TbMOFs before and after being immersed into EPI.

Table S1 Lifetimes of CB@CH_3-TbMOFs immersed in H_2O, other serum components and EPI.

Substance	**H_2O**	**Urea**	**$NaHCO_3$**	**L-Pro**	**KCl**	**$MgCl_2$**	**NaCl**	**$CaCl_2$**	**Glu**	**EPI**
Lifetimes	**848.84μs**	**962.45μs**	**951.23μs**	**949.38μs**	**944.31μs**	**935.31μs**	**908.22μs**	**892.45μs**	**880.89μs**	**0.9123μs**

Table S2 The truth table of Gate 1, Gate 2 and Gate 3.

(a) **Gate 1**

Input 1		Output 1
C_{EPI}<0.08mg/mL	**λex**	**Light 1**
1	0	0
1	1	0
0	0	0
0	1	1

(b) **Gate 2**

Input 2			Output 2
C_{EPI}<0.2mg/mL	**λex**	**Output 1**	**Light 2**
1	0	0	0
1	1	0	0
0	0	0	0
0	1	0	0
1	0	1	0
1	1	1	0
0	0	1	0
0	1	1	1

(c) **Gate 3**

Input 3			Output 3
C_{EPI}<0.8mg/mL	**λex**	**Output 2**	**Light 3**
1	0	0	0
1	1	0	0
0	0	0	0
0	1	0	0
1	0	1	0
1	1	1	0
0	0	1	0
0	1	1	1