

Supporting Information for

ORIGINAL ARTICLE

A homogenous nanoporous pulmonary drug delivery system based on metal-organic frameworks with fine aerosolization performance and good compatibility

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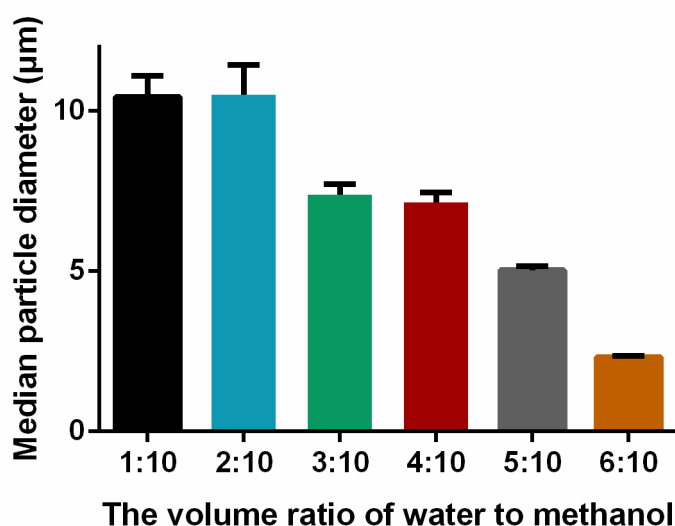


Figure S1 Particle size of CD-MOF prepared with different volume ratios of methanol to water (Data are expressed as mean \pm SD, $n=3$).

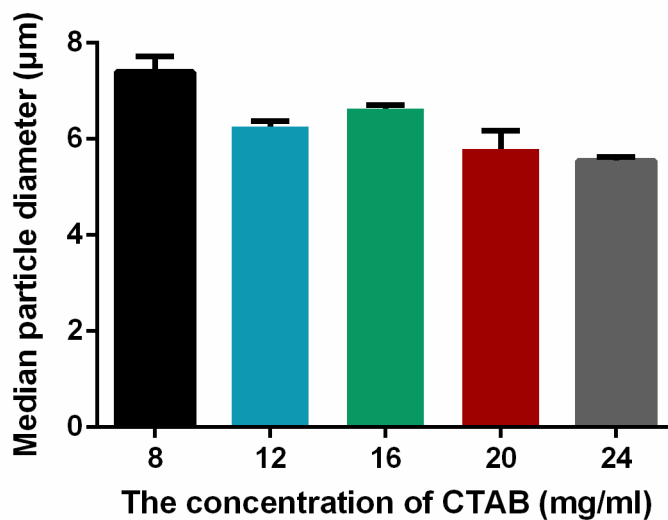


Figure S2 Particle size of CD-MOF prepared with different concentrations of CTAB

(Data are expressed as mean \pm SD, $n=3$).

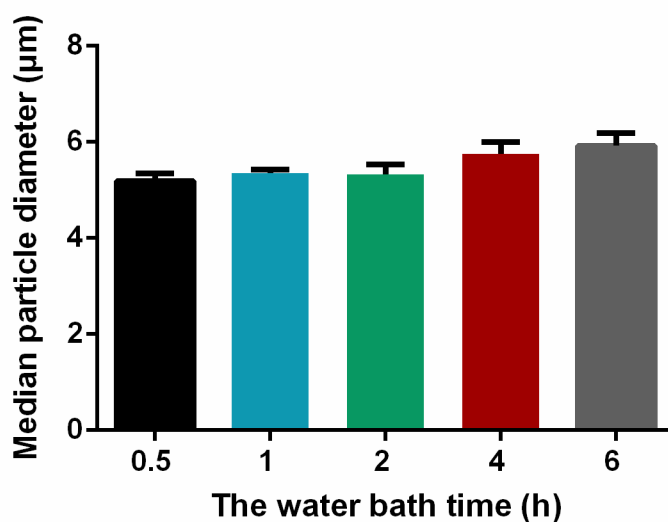


Figure S3 Particle size of CD-MOF prepared with different water bath time (Data are

expressed as mean \pm SD, $n=3$).

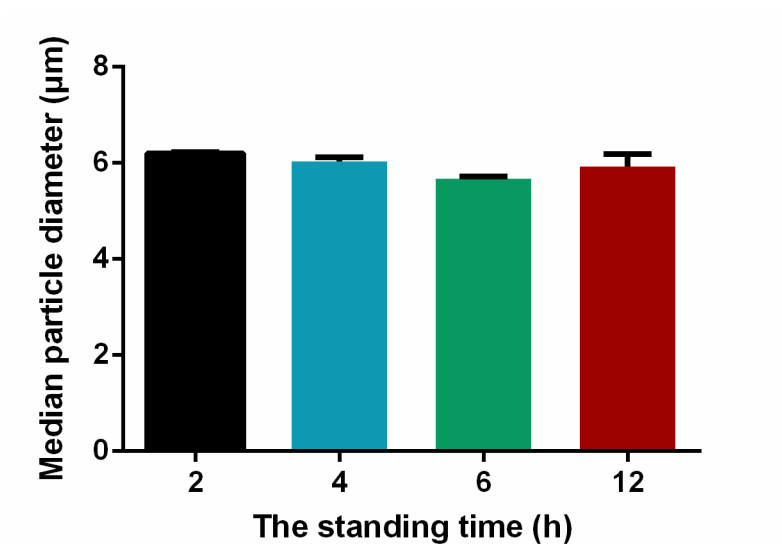


Figure S4 Particle size of CD-MOF prepared with different standing time (Data are expressed as mean \pm SD, $n=3$).

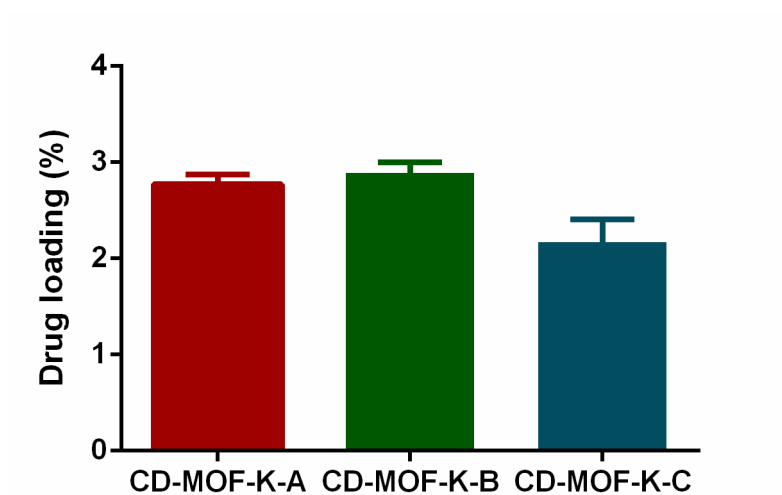


Figure S5 The drug loading of CD-MOF-K-A, CD-MOF-K-B, and CD-MOF-K-C (Data are expressed as mean \pm SD, $n=3$).

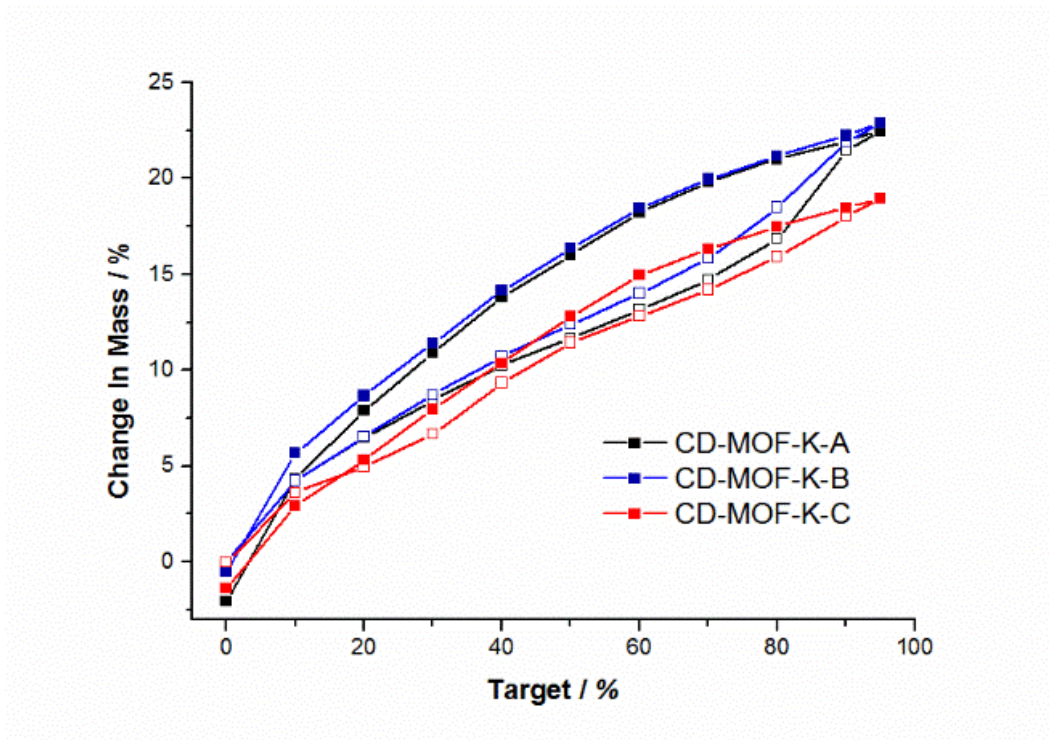


Figure S6 Water sorption/desorption isotherms for CD-MOF-K-A, CD-MOF-K-B, and CD-MOF-K-C.

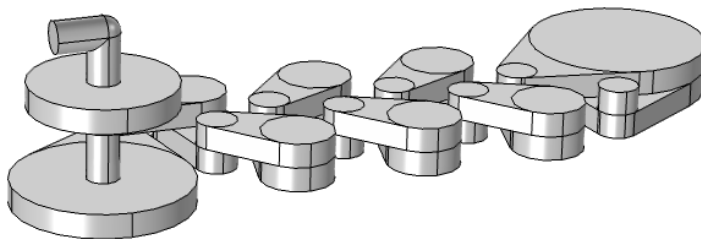


Figure S7 The NGI model established by finite element method.

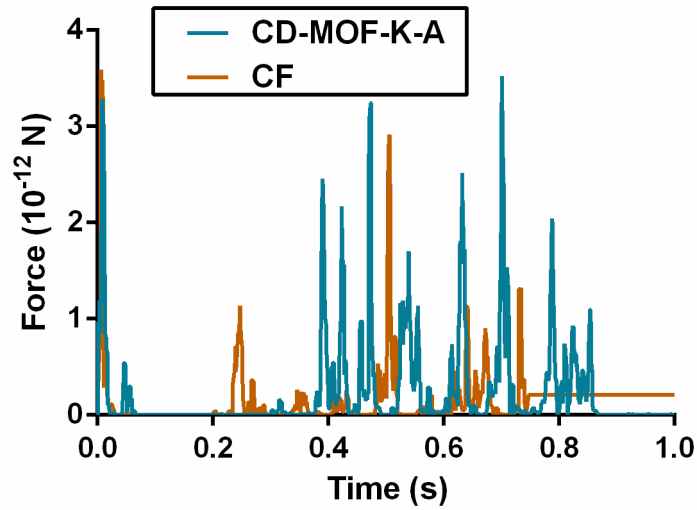


Figure S8 The drag and lift force of CD-MOF-K-A and CF by finite element method.

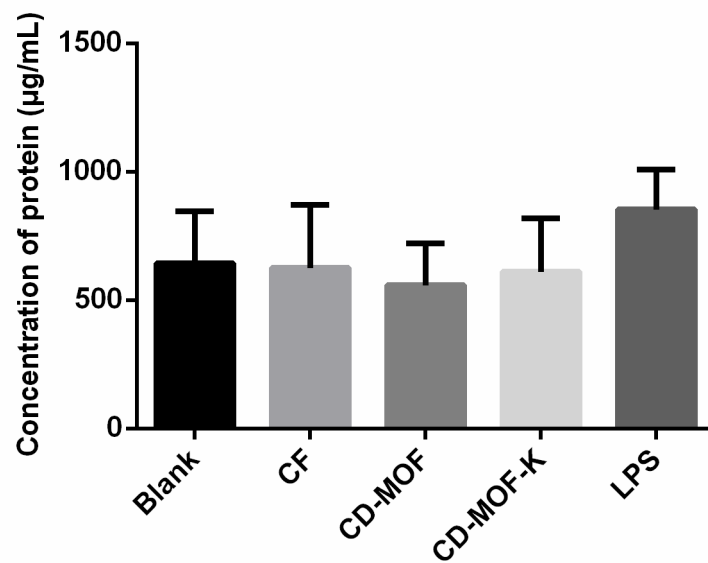


Figure S9 Protein concentrations in BALF of rats after pulmonary delivery of different samples for 48 h (Data are expressed as mean \pm SD, $n=6$).

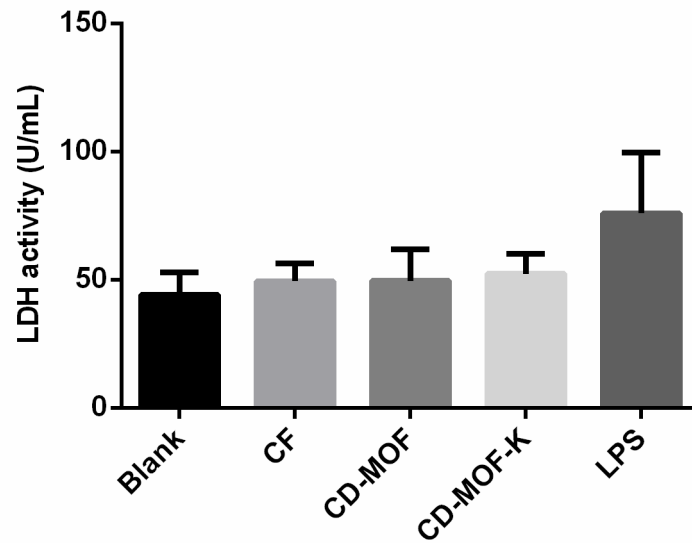


Figure S10 LDH activity in BALF of rats after pulmonary delivery of different samples into rats for 48 h (Data are expressed as mean \pm SD, $n=6$).

Table S1 Particle size distributions of different CD-MOF-K and micronized ketoprofen.

| Sample | $D[4, 3]$ (μm) | $d(0.1)$ (μm) | $d(0.5)$ (μm) | $d(0.9)$ (μm) | S_{pan} |
|-----------------------|-----------------------------|----------------------------|----------------------------|----------------------------|------------------|
| CD-MOF-K-A | 2.90 ± 0.08 | 0.58 ± 0.05 | 1.82 ± 0.14 | 6.16 ± 0.82 | 3.05 ± 0.34 |
| CD-MOF-K-B | 7.63 ± 0.79 | 0.63 ± 0.03 | 4.07 ± 0.16 | 16.54 ± 1.55 | 3.91 ± 0.42 |
| CD-MOF-K-C | 6.73 ± 0.15 | 2.89 ± 0.12 | 6.20 ± 0.14 | 11.54 ± 0.29 | 1.40 ± 0.05 |
| Micronized ketoprofen | 2.81 ± 0.09 | 1.12 ± 0.06 | 2.50 ± 0.08 | 4.96 ± 0.15 | 1.53 ± 0.04 |

Data are mean \pm SD, $n=3$.

Table S2 Bulk density, tapped density, and Carr's index of CD-MOF-K-A, CD-MOF-K-B, CD-MOF-K-C, and CF

| Sample | Bulk density (mg/cm ³) | Tapped density (mg/cm ³) | Carr's index (%) |
|------------|------------------------------------|--------------------------------------|------------------|
| CD-MOF-K-A | 219.73 ± 18.97 | 524.35 ± 39.16 | 58.09 |
| CD-MOF-K-B | 216.86 ± 15.29 | 390.55 ± 22.82 | 44.47 |
| CD-MOF-K-C | 266.97 ± 15.02 | 420.35 ± 21.70 | 36.49 |
| CF | 729.44 ± 4.83 | 911.81 ± 6.04 | 20.00 |

Data are expressed as mean ± SD, *n*=3.