

**Figure S1 Validation of the MCT plus - pneumonectomy induced PAH model.** (A–B) Rats were given a single intraperitoneal injection of 60 mg/kg MCT one week after left pneumonectomy or vehicle, and RV systolic pressure (A) and RV weight (B) were measured 1, 2, 3, or 4 weeks after MCT challenge. (C–F) H&E staining and a-SMA staining of lung tissue sections at 4 weeks after MCT injection. (G) The % medial wall thickness was calculated as [(medial thickness×2)/external diameter]×100. Scale bars = 50 µm. All data are expressed as mean ± SD. n = 6 per group. \*\*p<0.01 and \*p<0.05.



**Figure S2 Representative double-immunostained images** of P2X7R (Red), co-stained for FITC-CD68, DAPI (Blue) for nuclei and merged images in the P/MCT (A), sham group (B) and negative control (C), Original magnification × 40. Scale bar = 50 μm for all images.