**Self-supporting smart air filters based on PZT/PVDF electrospun nanofiber composite membrane**

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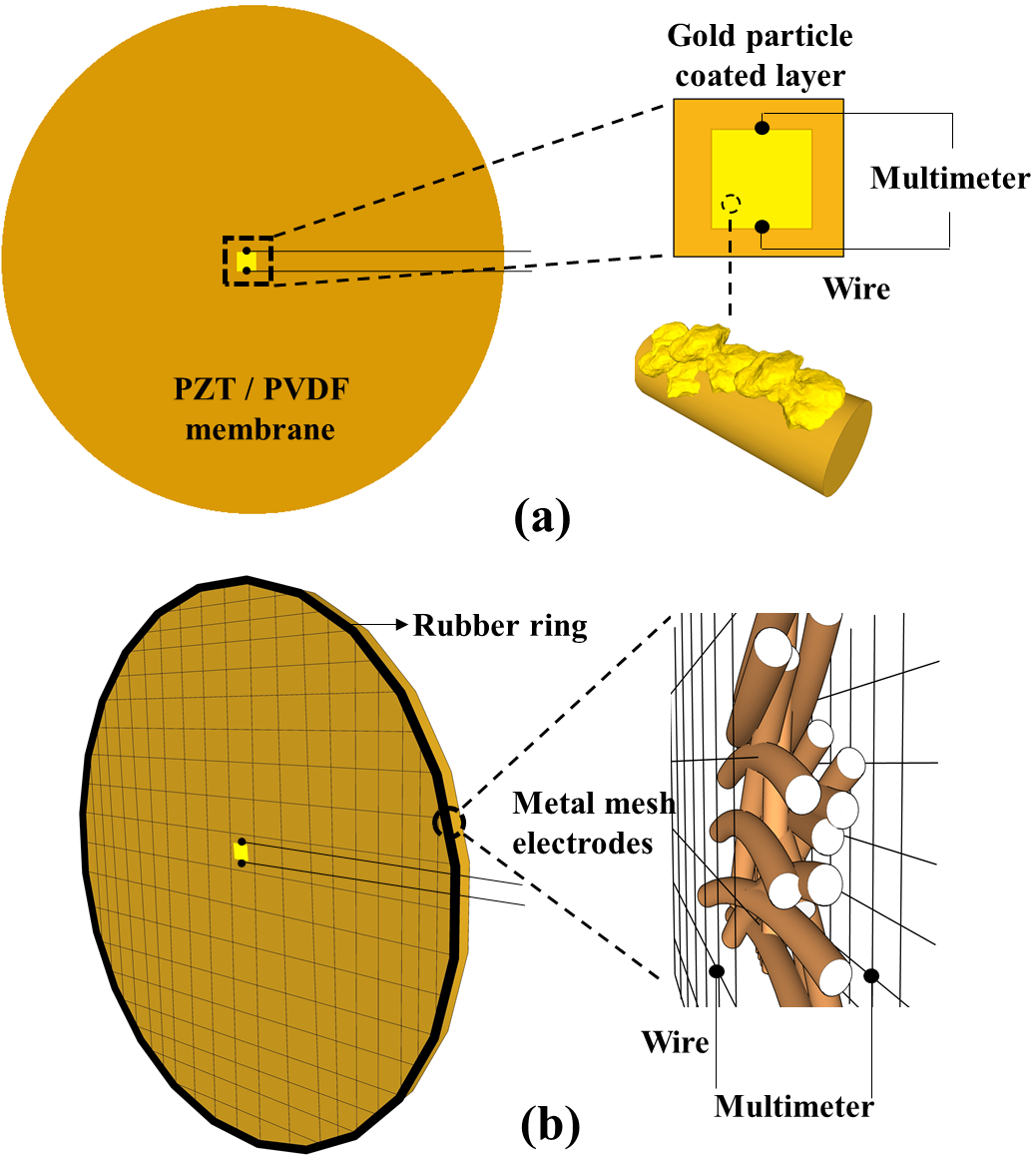


Fig.S1 The schematic diagram of SSSAF. (a) VOCs sensor.(b) Pressure drop sensor.

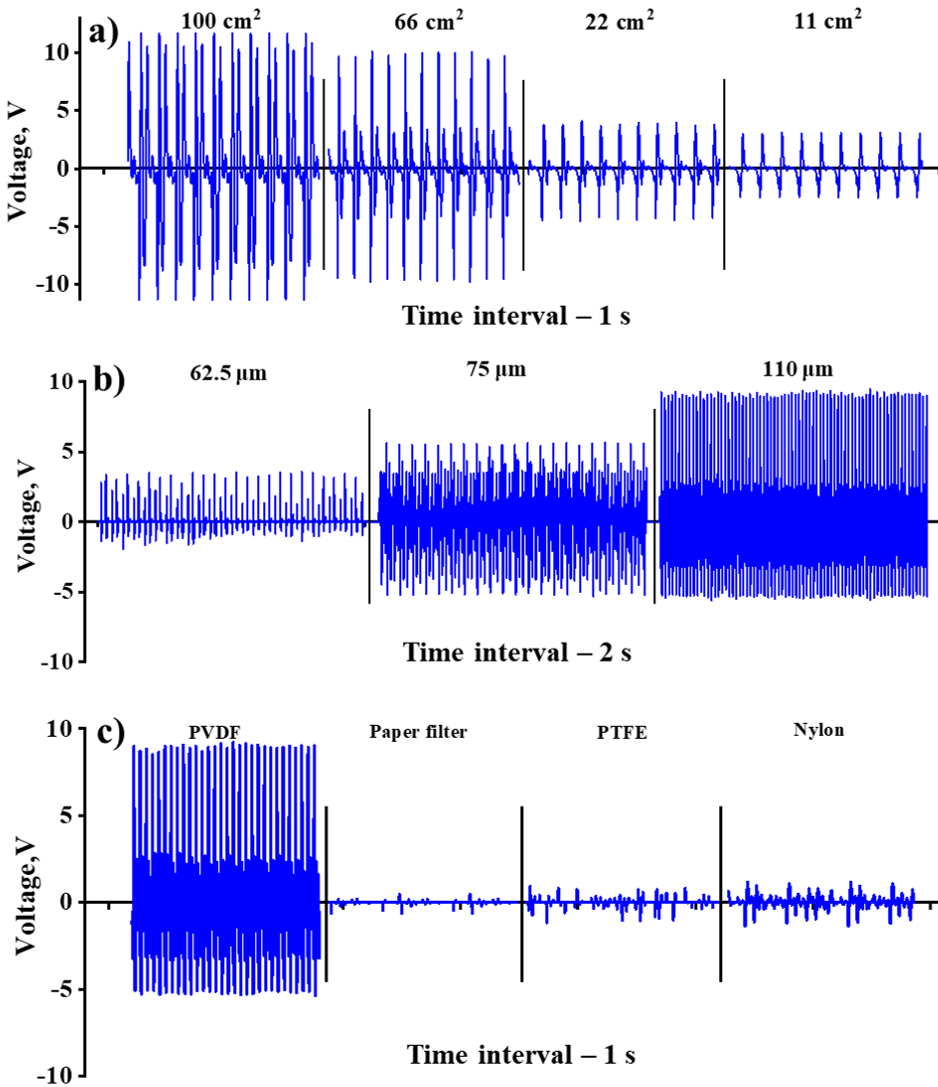


Fig. S2 a) The output voltage signal of SSSAF equipped with PZT/PVDF membranes of different area. b) The output voltage signal of SSSAF equipped with PZT/PVDF membranes of different thickness. c) The output voltage signal of PVDF membrane, paper filter, PTFE membrane and nylon membrane.



Fig. S3 Three voltage signals for energy harvesting measurement, all signals were generated by SSSAF based nanogenerator

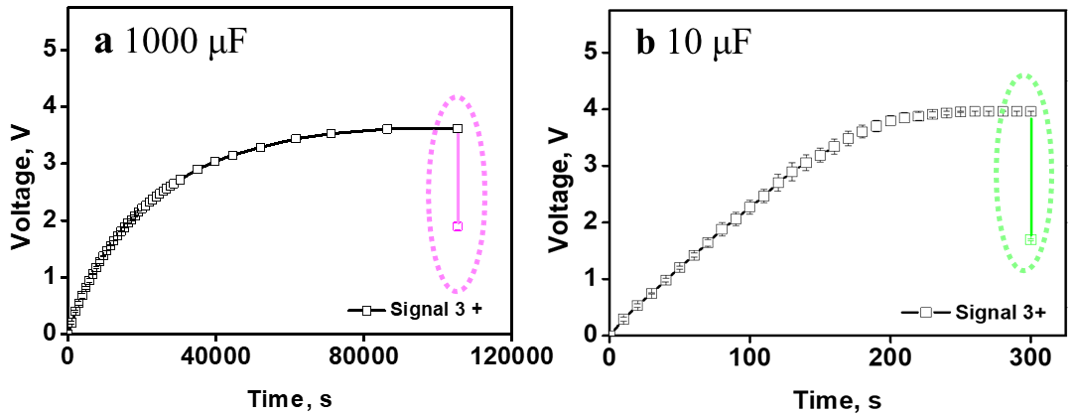


Fig. S4 Charge curves of capacitors with different capacity.

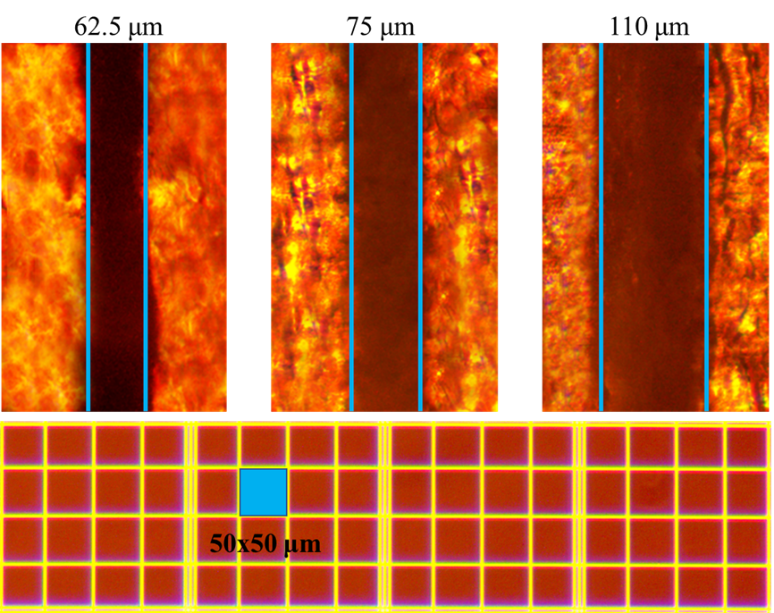


Fig. S5 Thickness of PZT/PVDF membranes which were used to equip SSSAF. The film was immersed in epoxy resin, cured and sliced, and the thickness of the film was measured via an optical microscope.



Fig. S6. Electrical discharge curve of capacitor which used for inhibiting bacteria, a) curve of electrical current, b) curve of voltage.