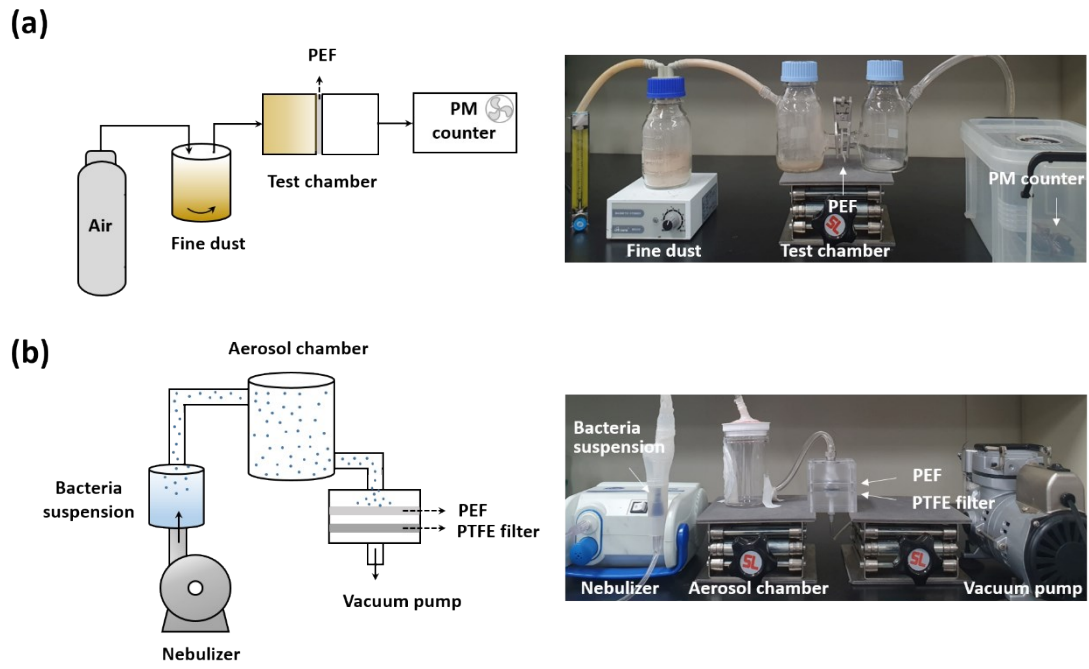


## **Supplementary information**

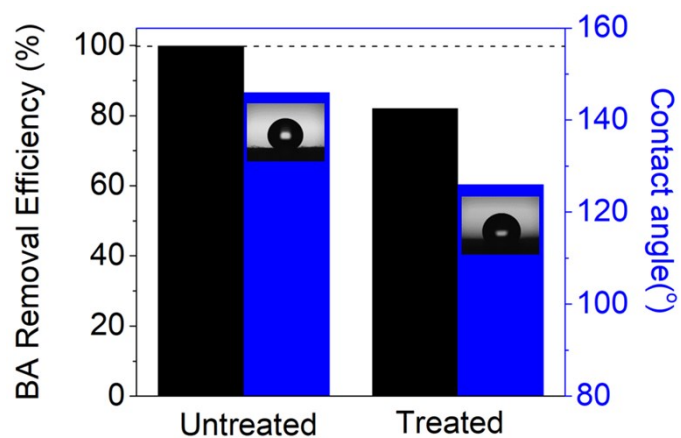
### **Regeneration of an Electret Filter by Contact Electrification**

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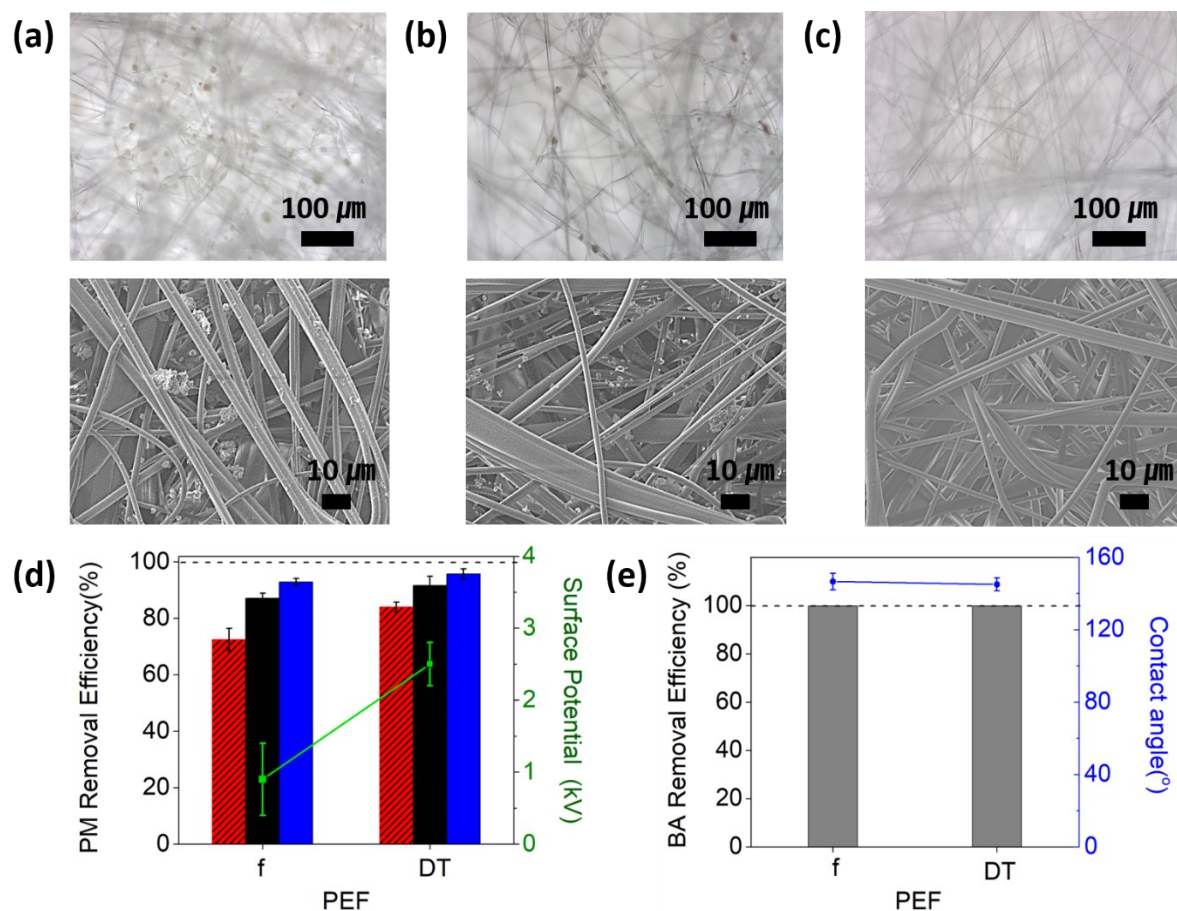
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**Figure S1.** Schematic and photo of the experimental setup for the evaluation of PM removal efficiencies; (a) fine dust and (b) bioaerosol (BA).



**Figure S2.** BA removal efficiencies and water contact angles of f-PEF before and after atmospheric Ar plasma treatment. After f-PEF was irradiated by Ar plasma for 30 min, the water contact angle was reduced from 146.2° to 125.8°, and the bioaerosol removal efficiency decreased from 99.9% to 86.4%. This result indicates that water repelling property of PEF plays a key role in blocking aqueous bioaerosol.



**Figure S3.** Optical microscope (upper panel) and scanning electron microscope (lower panel) images of PEFs washed with (a) hot water (90°C), (b) steam (100°C), and (c) aqueous detergent solution (room temperature). Fine dusts were completely removed by washing with water with detergent (0.05% Alconox aqueous solution) while fine dusts remained after washing with hot water or steam. After fine dusts were removed by washing with detergent, the PEF was rinsed with water and then rubbed with a Teflon block 15 times of double rubs (DT-PEF). (d) Surface potentials (green square) and PM removal efficiencies for PM<sub>1.0</sub> (red), PM<sub>2.5-1.0</sub> (black) and PM<sub>10-2.5</sub> (blue). The PM removal efficiencies of DT-PEF were 84.0%, 91.6% and 95.7% for PM<sub>1.0</sub>, PM<sub>2.5-1.0</sub> and PM<sub>10-2.5</sub>, respectively, indicating that the efficiencies increased by 11.6%, 4.5% and 2.8%, respectively, compared to those of f-PEF. (e) The BA removal efficiencies of f-PEF and DT-PEF were ~100% due to the high water contact angles (~145°).