Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Supporting Information

One-step sonochemical synthesis of a reduced graphene oxide – ZnO nanocomposite with antibacterial and antibiofouling properties

Environmental Science: Nano

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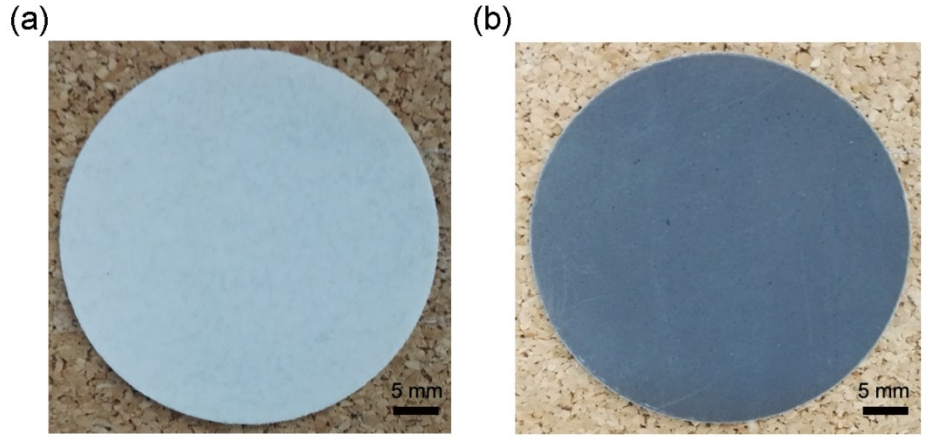

Fig. S1 Images of a pristine PES membrane (a) and a rGO–ZnO (5% w/w) incorporated PES membrane (b) fabricated using the phase inversion method. Coupon size: 46 mm in diameter.

Table S1 The composition of the synthetic wastewater used for the Zn^{2+} leaching experiments.

	Components	Concentration
Ionic salts	$NaHCO_3$	0.5 mM
	NH_4Cl	0.4 mM
	$CaCl_2$	0.2 mM
	$MgSO_4$	0.15 mM
	NaCl	8 mM
	KH_2PO_4	0.2 mM
Foulants	Humic acid	5 mg/L
	Sodium alginate	5 mg/L
	Bovine serum albumin	10 mg/L

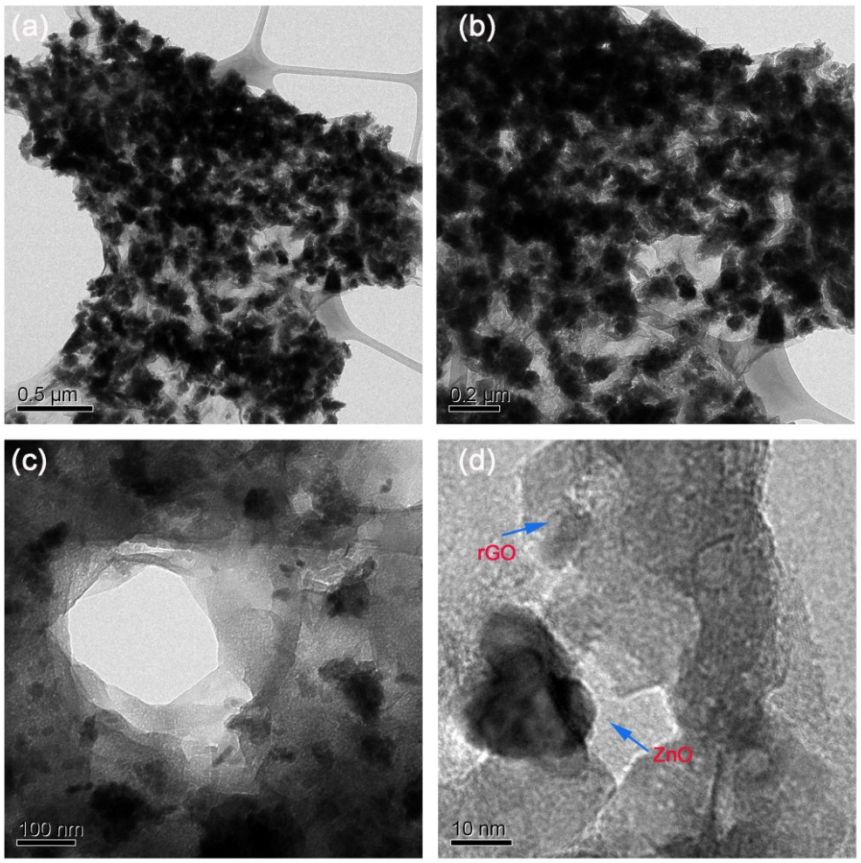

Fig. S2 TEM images of rGO–ZnO nanocomposites at different magnifications (0.5 μm, 0.2 μm, 100 nm, and 10 nm).

Table S2. High-resolution XPS results of GO and rGO nanoparticles and rGO–ZnO nanocomposites.

	C1s (284.81 eV)	O1s (532.35 eV)	Zn 2p (1021.99 eV)	C1s		
				O–C=O (288.63 eV)	C–O/C–O–C (287.06 eV)	C=C (285.51 eV)
GO	67.39 %	32.61 %	/	16.86 %	37.76 %	17.27 %
rGO	78.06 %	21.94 %	/	6.00 %	19.71 %	/
rGO–ZnO	46.53 %	39.50 %	13.97 %	9.05 %	25.64 %	/

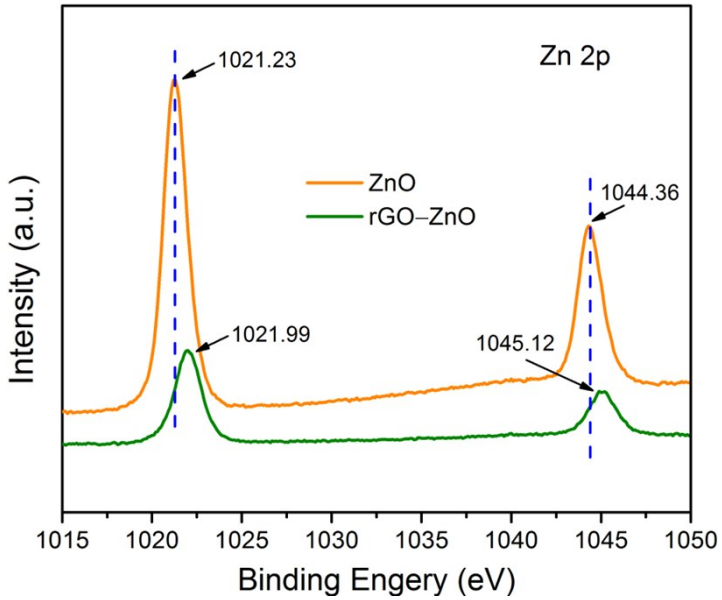

Fig. S3 Zn 2p high-resolution XPS spectra of ZnO nanoparticles and rGO–ZnO nanocomposites. The pure ZnO nanoparticle was prepared using the sonochemical method as the rGO–ZnO nanocomposites only without GO.

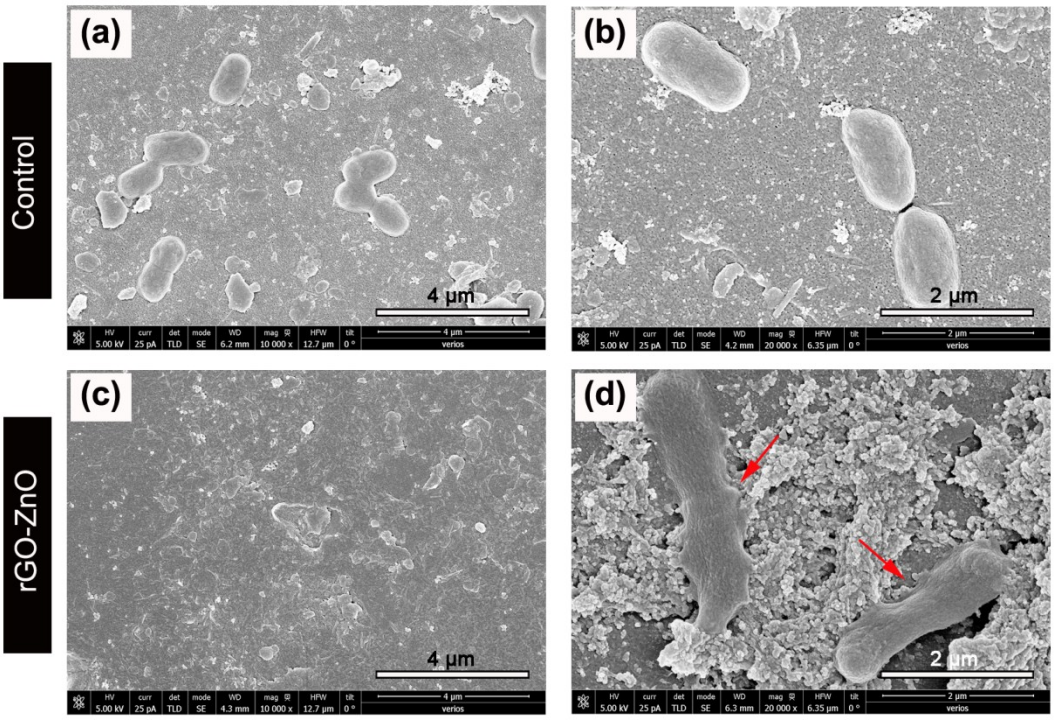

Fig. S4 SEM images of *E. coli* following the contact killing assay on the surface of the (a–b) uncoated and (c–d) rGO–ZnO coated PES membrane.

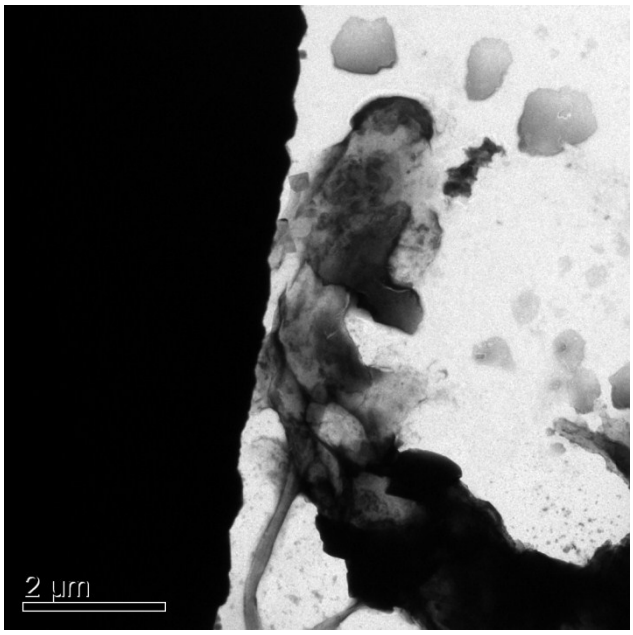

Fig. S5 A representative TEM image of a dead bacterium after the contact killing assay on a rGO–ZnO coated PES membrane.

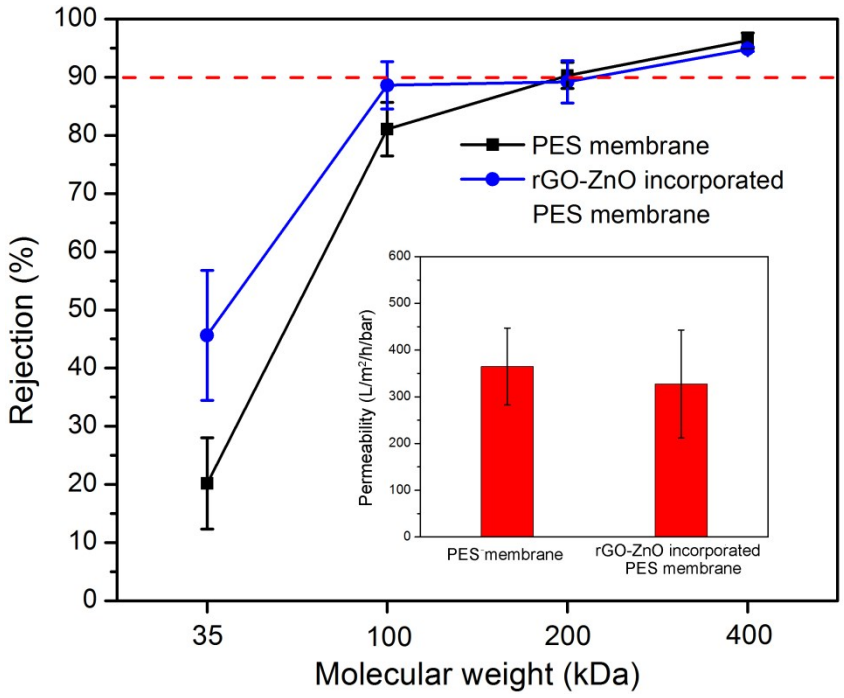

Fig. S6 The MWCO and water permeability (insert) of pristine PES membrane and rGO–ZnO incorporated PES membrane. The values are expressed as means ± SD, $n = 3$.

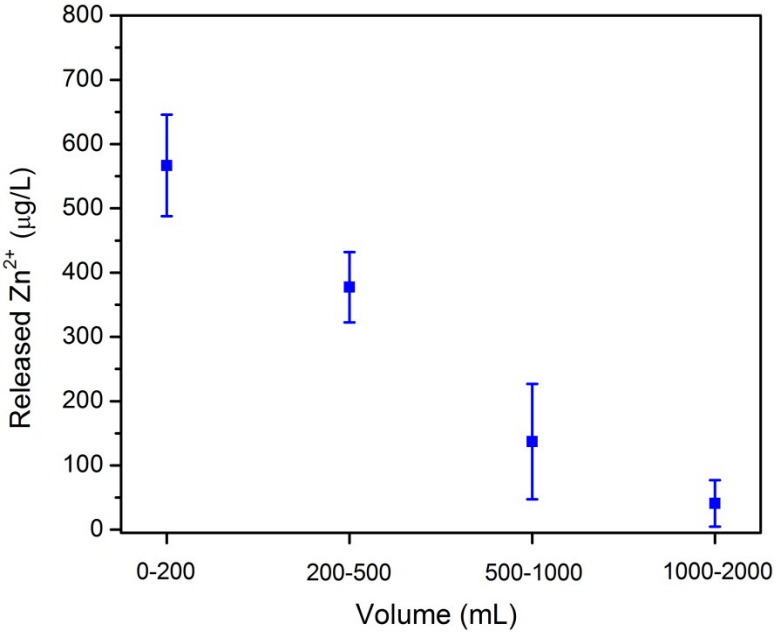

Fig. S7 The leaching behavior of Zn^{2+} from rGO–ZnO incorporated PES membrane (13.84 cm^2) during synthetic wastewater filtration. The values are expressed as means ± SD, $n = 2$.