

Supporting Information

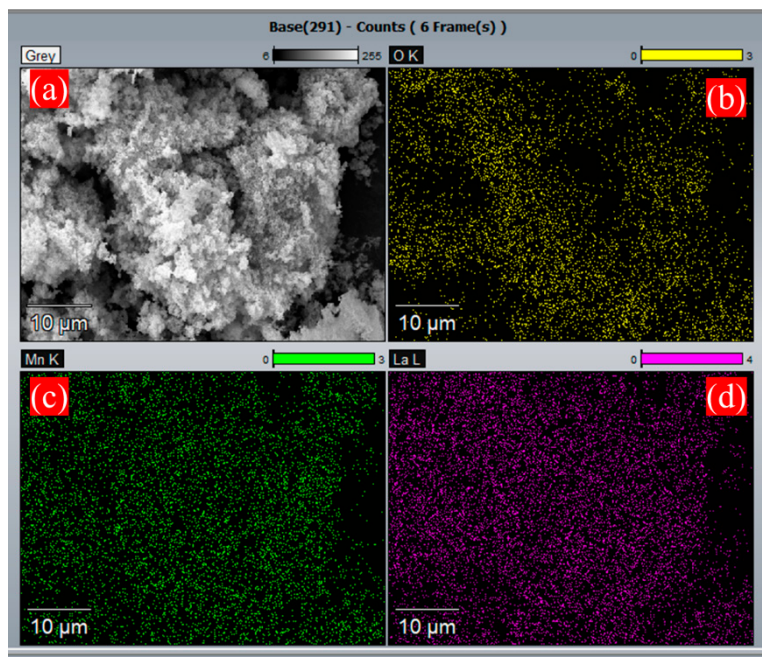


Figure S1. Elemental mapping on selected HRSEM (a), Oxygen (yellow dots) (b), Manganese (green dots) (c) and Lanthanum (purple dots) (d)s.

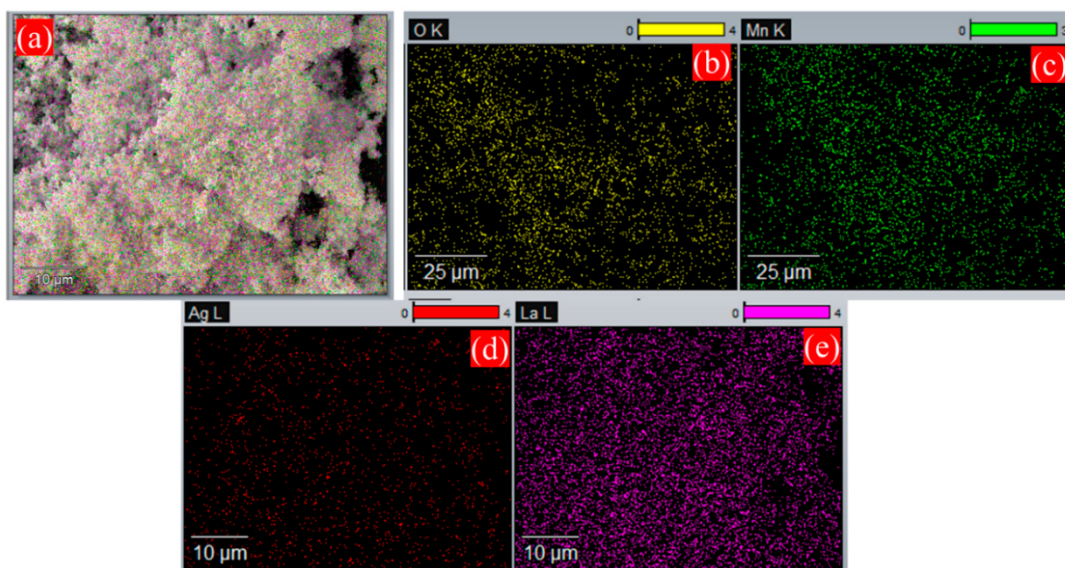


Figure S2. Elemental mapping on selected HRSEM (a), Oxygen (yellow dots) (b), Manganese (green dots) (c), Silver (red dots) (d), and Lanthanum (purple dots) (e).

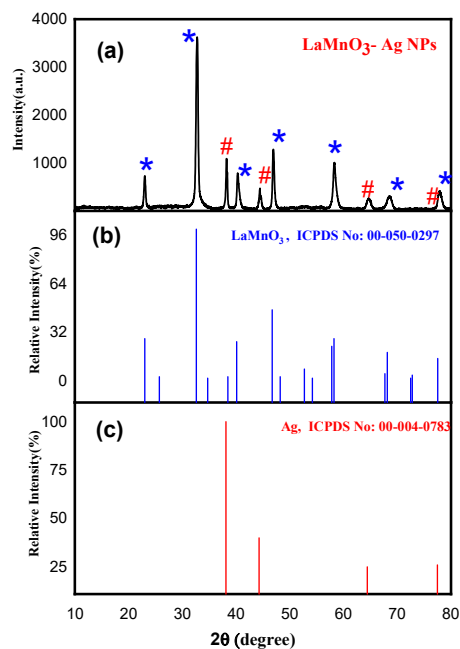


Figure S3. (a), XRD pattern of LaMnO₃-Ag nanocomposite after using fifth cycle RB dye degradation, (b), ICPDS reference peaks of LaMnO₃ with card number 00-050-0297, (c), ICPDS reference peaks of Ag with card number 00-004-0783,.

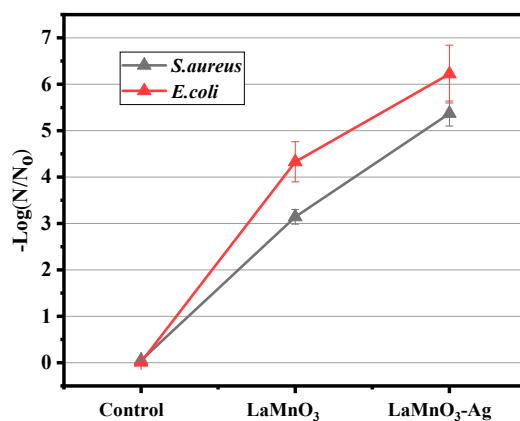


Figure S4. Antibacterial activity of LaMnO₃ and LaMnO₃-Ag nanomaterials for *S.aureus* and *E.coli* bacteria.

Table S1. Calculation of crystallite size (D) and micro-strain (ϵ) using XRD diffraction peaks LaMnO₃ nanoparticles alone.

LaMnO ₃ -Ag nanoparticles							Micro-strain (ϵ) = slope of W-H plot
S.No .	Peak position (2 θ)	Peak position (θ radian)	FWHM (β) degree	FWHM β (radian)	Crystalline size (D) nm	Average crystalline size (D) nm	
1	23.00769	0.200779972	0.25201	0.004398404	30.89043593	19.34	4.63×10^{-3}
2	32.73914	0.285702894	0.43595	0.007608763	17.48424741		
3	38.27883	0.334045809	0.16274	0.002840349	46.11747095		
4	40.36915	0.352287292	0.52548	0.009171356	14.18968951		
5	46.94815	0.409699898	0.39204	0.006842389	18.58693723		
6	44.47478	0.388115673	0.18491	0.003227288	39.76757946		
7	52.51614	0.458289777	0.64454	0.011249345	11.05365269		
8	58.34335	0.509141777	0.71798	0.012531115	9.661356065		
9	64.69094	0.564534950	0.73785	0.012877912	9.096202892		
10	68.55795	0.598280978	0.84286	0.014710682	7.788251849		
11	77.95077	0.680248795	0.76198	0.013299060	8.105225076		

Table S2. Calculation of crystallite size (D) and micro-strain (ϵ) using XRD diffraction peaks of LaMnO₃- Ag nanoparticles.

LaMnO ₃ nanoparticles							Micro-strain (ϵ) = slope of W-H plot
S. No	Peak position (2 θ)	Peak position (θ radian)	FWHM (β) degree	FWHM β (radian)	Crystallite size (D) nm	Average crystalline size (D) nm	
1	22.99708	0.2006873 82	0.29656	0.0051759 48	26.250490 36	13.77	3.39×10^{-3}
2	32.71981	0.2855342 08	0.46682	0.0081475 46	16.328853 16		
3	40.32942	0.3519405 82	0.54596	0.0095288 00	13.659147 14		
4	46.92584	0.4095052 06	0.44816	0.0078218 68	16.260797 11		
5	52.20329	0.4555596 45	0.60722	0.0105979 88	11.748773 52		
6	58.33925	0.5091059 98	0.68060	0.0118787 11	10.192181 85		
7	68.52381	0.5979830 50	0.90390	0.0157760 31	7.2637888 17		
8	78.00835	0.6807512 76	0.73034	0.0127468 38	8.4529230 29		