Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supplementary Information

Size-dependent antimycobacterial activity of titanium oxide nanoparticles against *Mycobacterium tuberculosis*

Vaikundamoorthy Ramalingam[a,b,*], Subramaniam Sundaramahalingam[c], Rajendran Rajaram[a,*]

[a]DNA Barcoding and Marine Genomics Laboratory, Department of Marine Science, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India

[b]Department of Animal Science, Chonbuk National University, Jeonju, Republic of Korea

[c]Department of Electrical and Electronics Engineering, Mepco Schlenk Engineering College, Sivakasi, Tamil Nadu, India.

*** Corresponding Email**

VR: gene717ram@gmail.com;

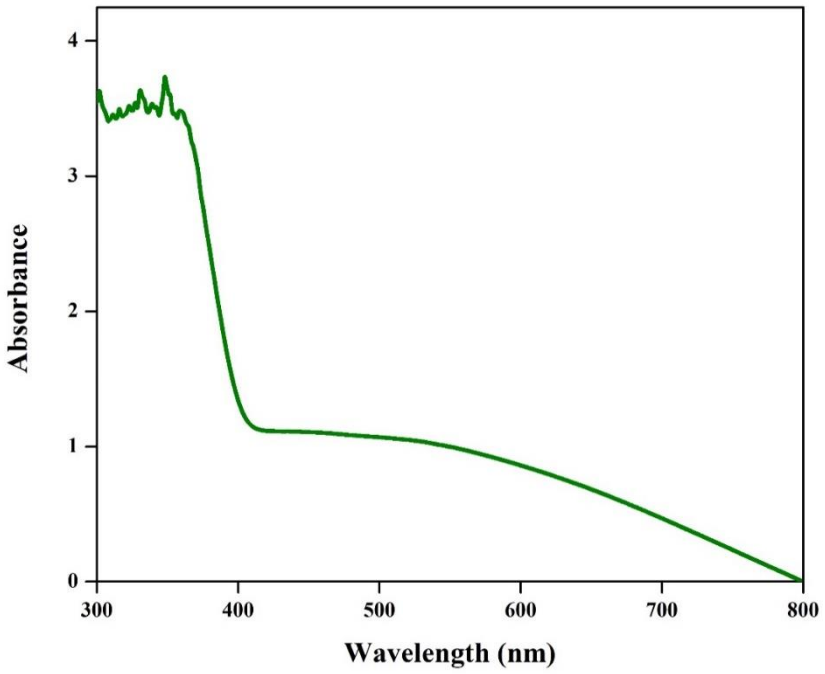
RR: drrajaram69@rediffmail.com

Table S1 UV and DRS UV, binding energy, Zeta potential and size distribution, average size (TEM and XRD)

TiO_2	Bandgap (eV)	Zeta potential (mv)	Polydispersity index (PDI)	Size distribution (nm)	Average size (nm)	
					TEM	XRD
6 hr	3.9	-12	0.712	70-85	77.4	75.8
12 hr	3.56	-24	0.284	45-60	53.5	53.2
18 hr	3.21	-30	0.139	26-38	31	30.4
24 hr	3.06	-38	0.057	10-22	16	16.5

Fig. S1UV-visible diffuse reflectance (DRS) spectra of TiO_2 nanoparticles (a) and the Tauc plot (b)

a)



b)

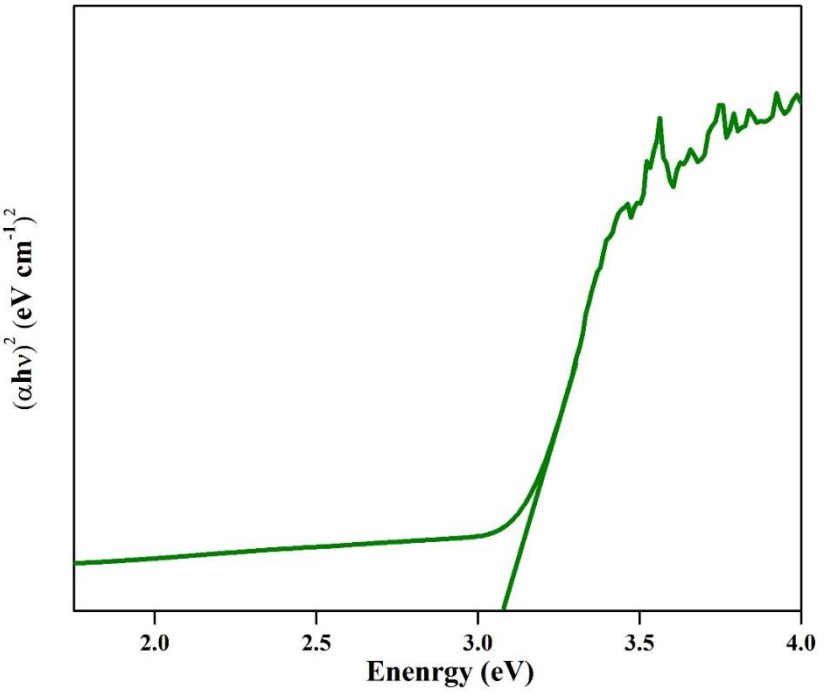
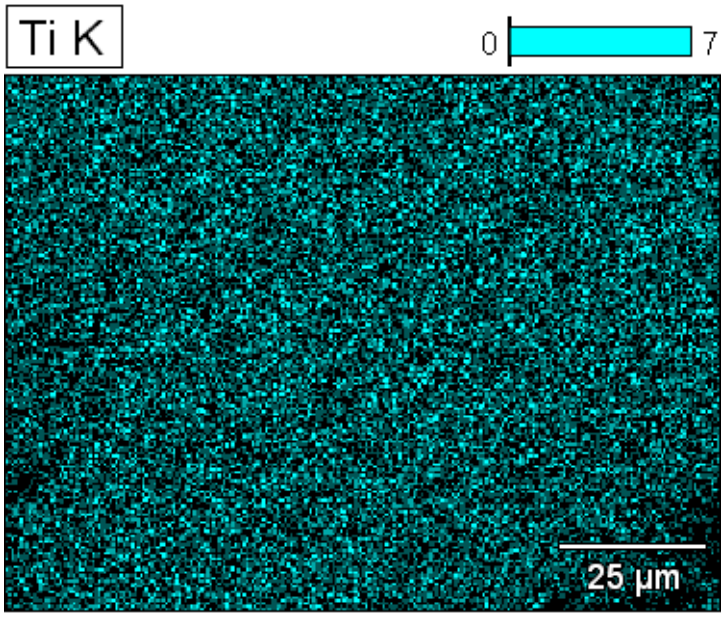


Fig. S2 the elemental mapping of TiO_2 nanoparticles observed using SAM nano probe for Ti (a), and O (b).

a)



b)

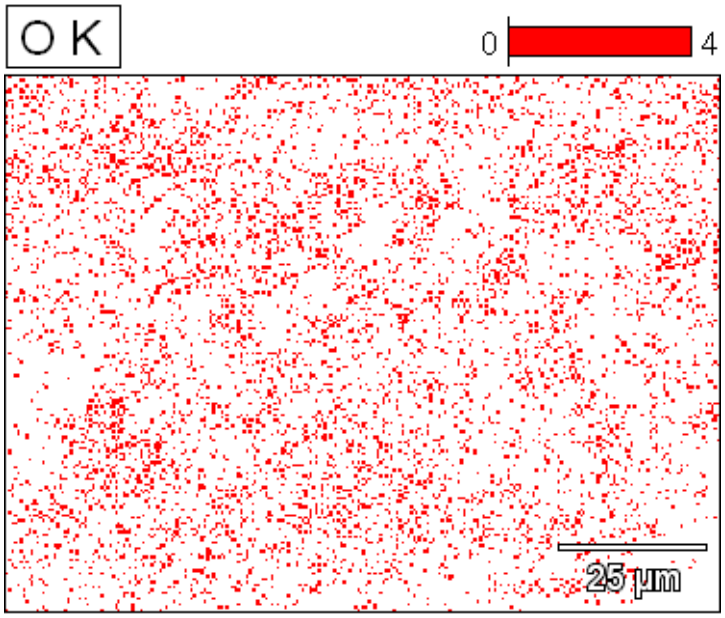


Fig. S3 TEM micrographs of TiO_2 and its corresponding size distribution histogram prepared at different time interval 6h, 12h and 18h

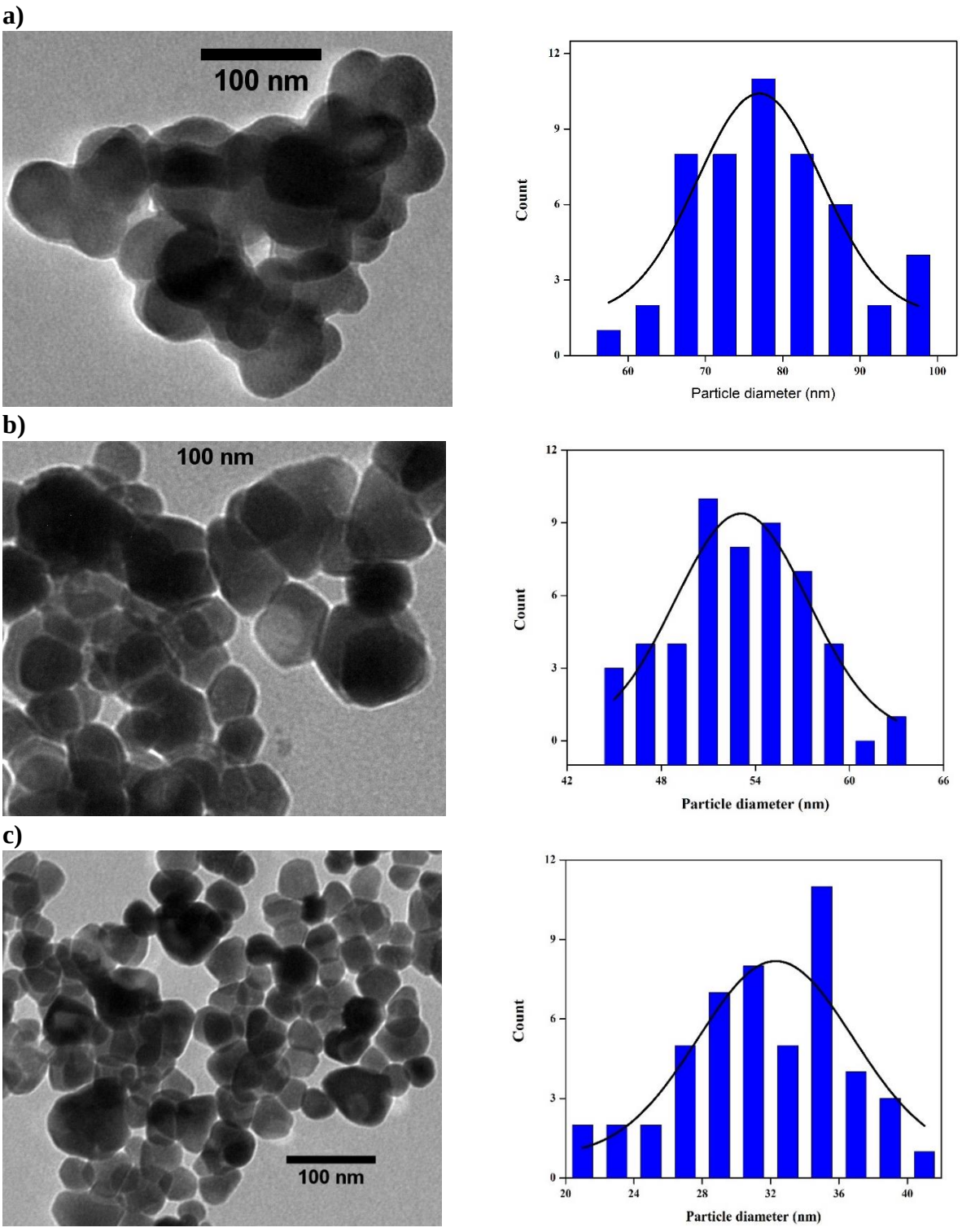


Fig. S4 Zeta potential of TiO_2 nanoparticles prepared at different time interval 6 h (70-85 nm), 12 h (45-60 nm), 18 h (26-38 nm) and 24 h (10-22 nm)

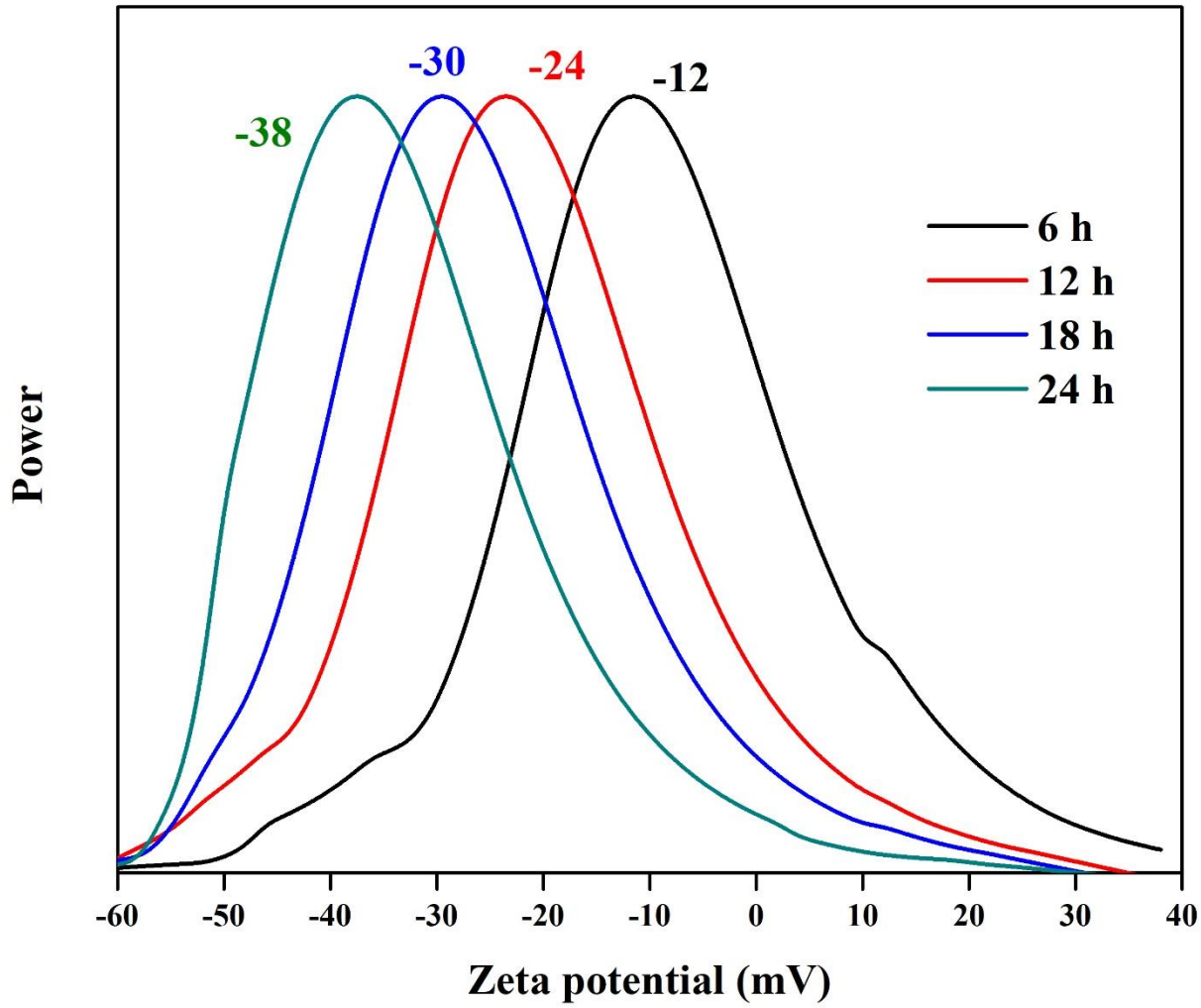


Fig. S5 The antimycobacterial activity of Rifampicin (0-20 µg/ml) against *M. tuberculosis* (a), *M. bovis* (b) and *Mycobacterium* sp. (c) after 24 h treatment.

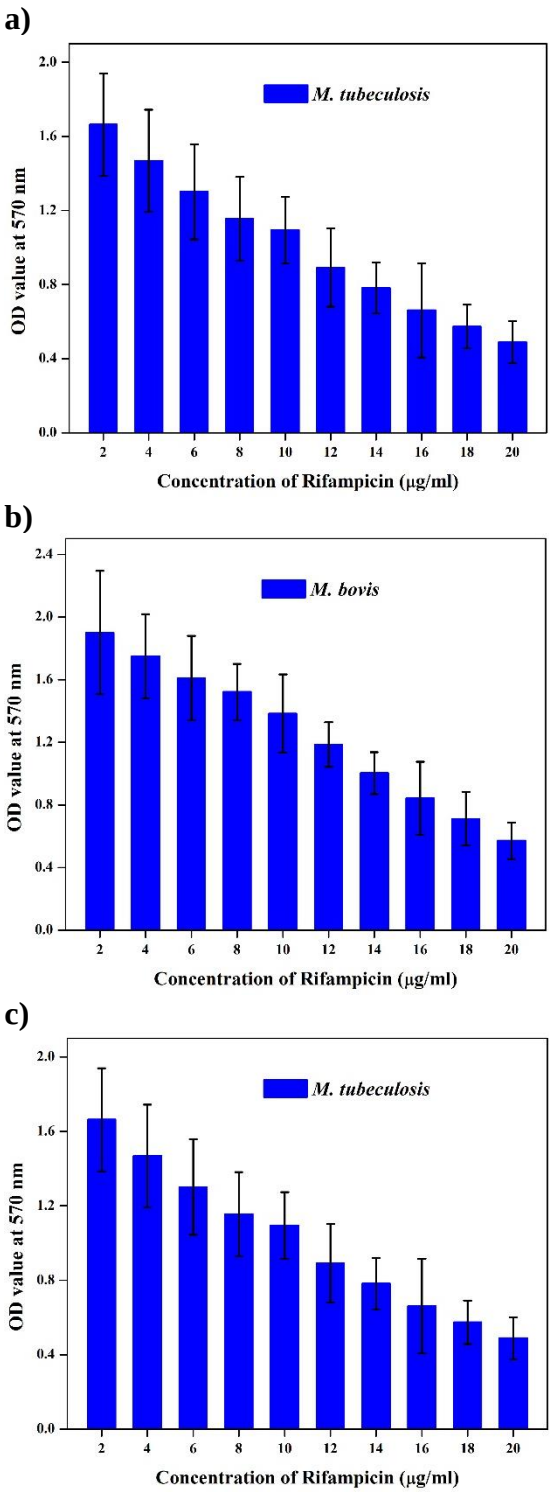


Fig. S6 Effect of 70-85 nm in size ranged TiO_2 nanoparticles (100 µg/ml) on biofilm formation of *M. tuberculosis*, *M. bovis* and *Mycobacterium* sp.

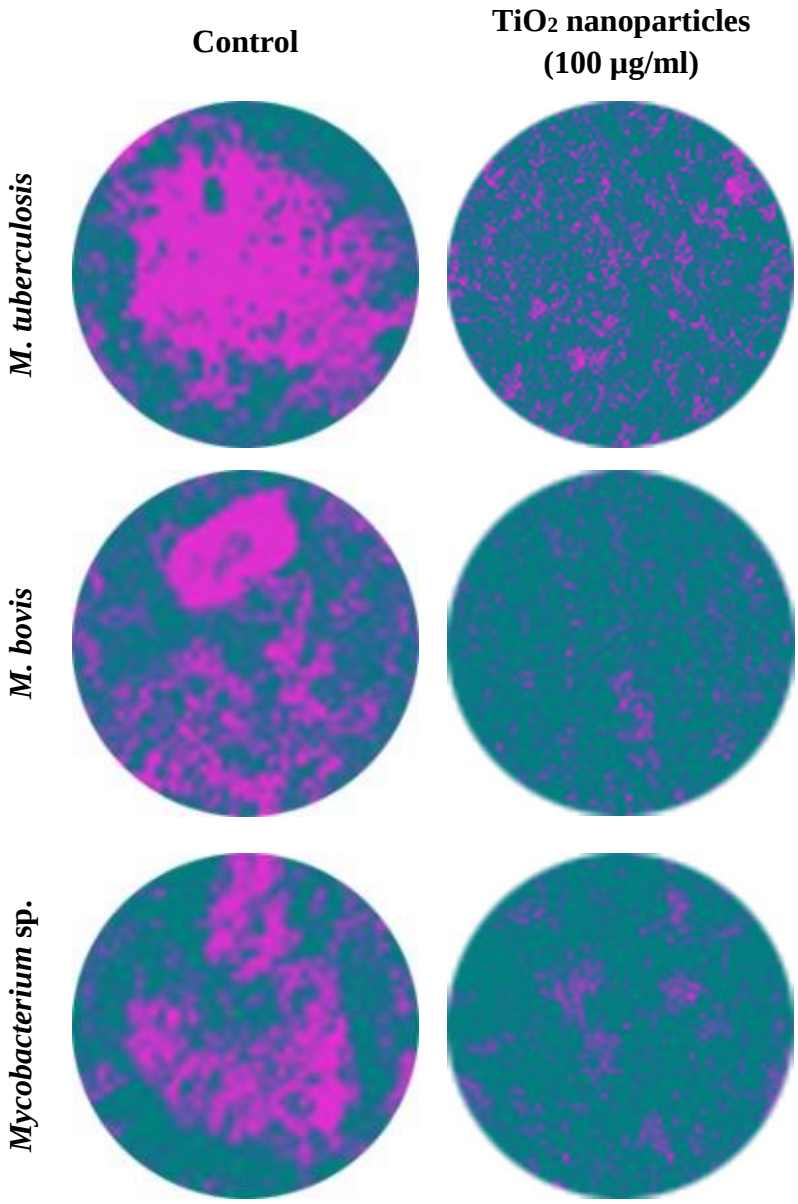


Fig. S7 Effect of 45-60 nm in size ranged TiO_2 nanoparticles (100 µg/ml) on biofilm formation of *M. tuberculosis*, *M. bovis* and *Mycobacterium* sp.

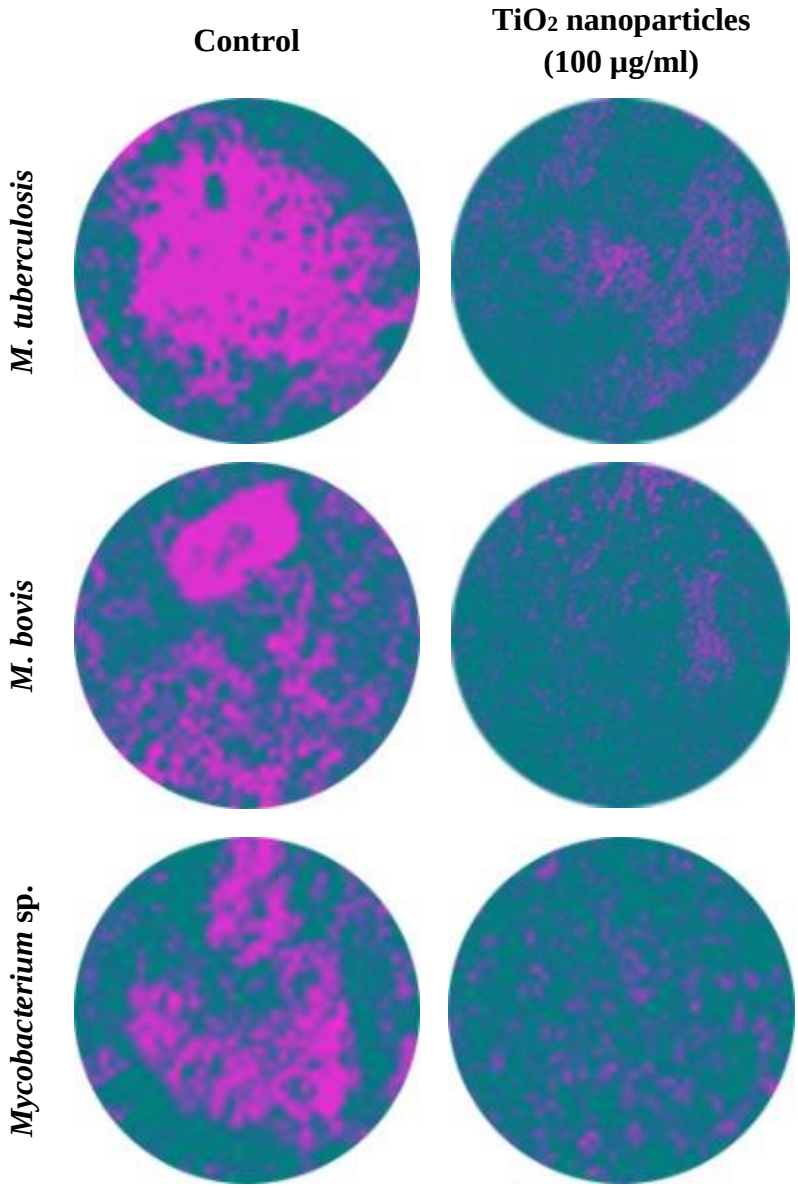


Fig. S8 Effect of 26-38 nm in size ranged TiO_2 nanoparticles (100 µg/ml) on biofilm formation of *M. tuberculosis*, *M. bovis* and *Mycobacterium* sp.

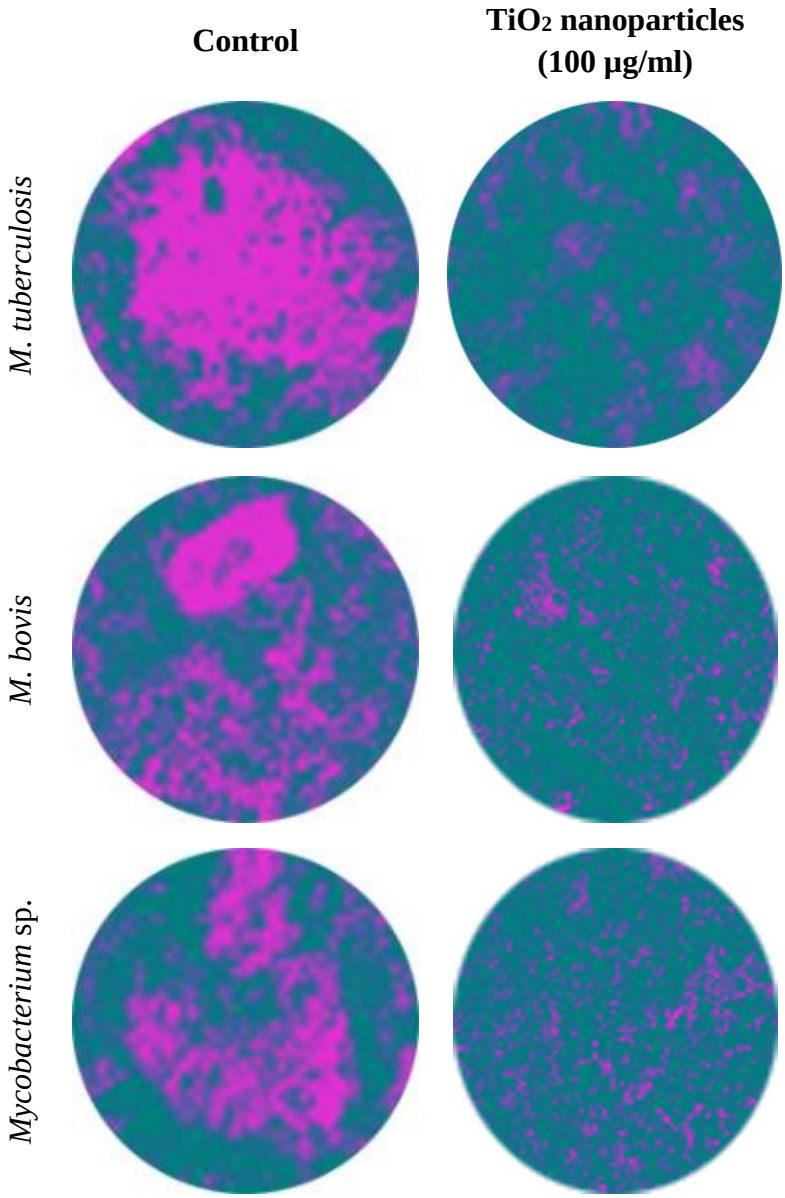


Fig. S9 Effect of Rifampicin (12 µg/ml) on biofilm formation of *M. tuberculosis*, *M. bovis* and *Mycobacterium* sp.

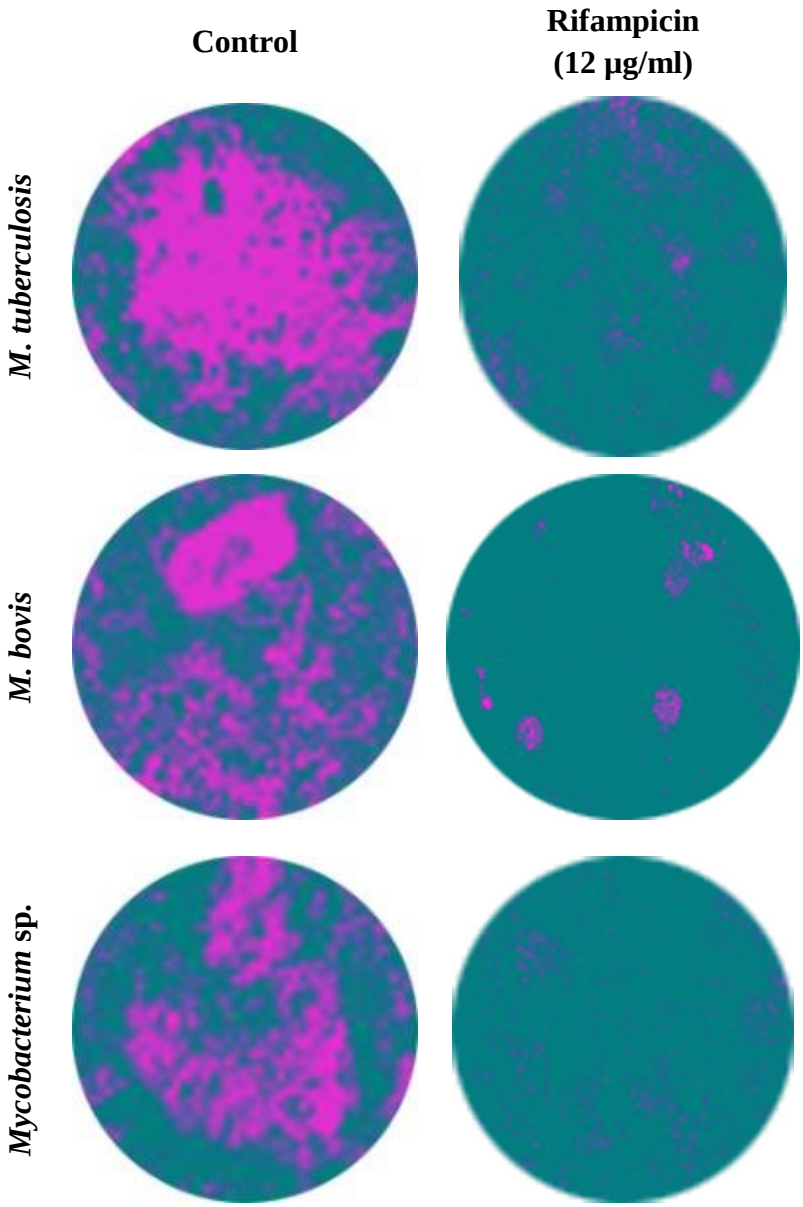


Fig. S10 Possible mechanism involved in the TiO_2 nanoparticles mediated inhibition of growth of mycobacteria

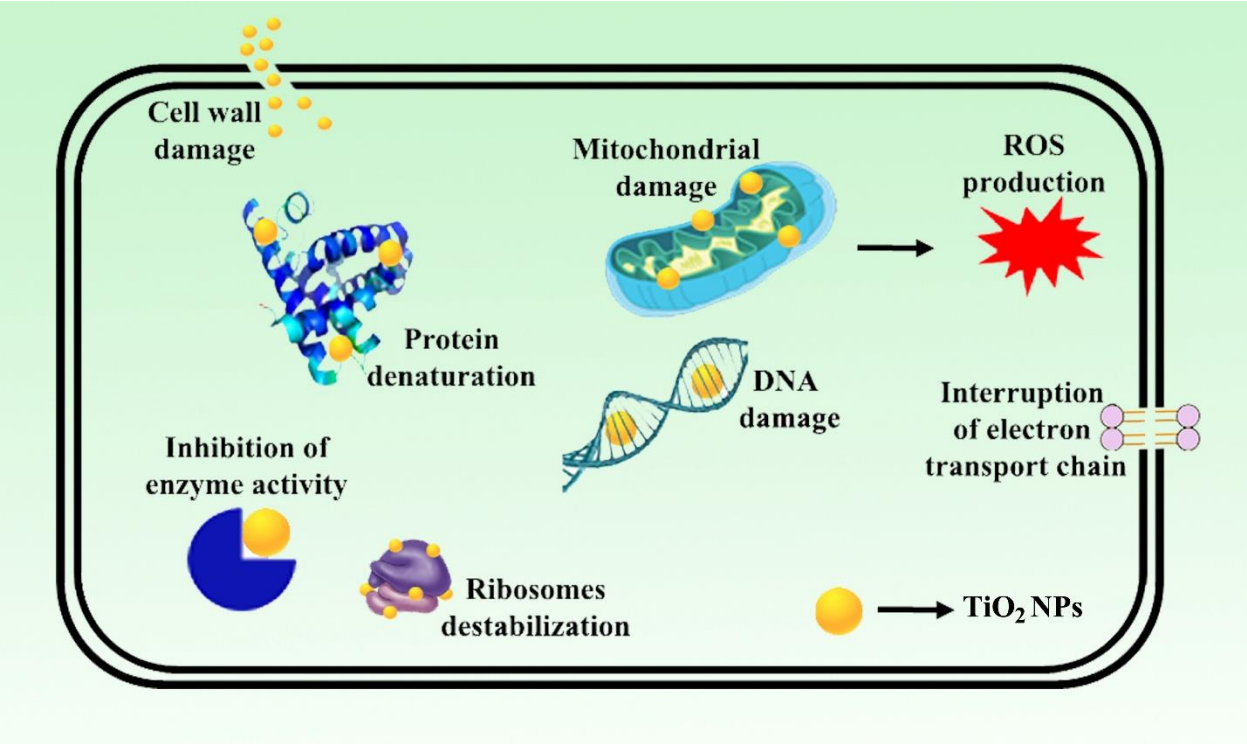


Fig. S11 *In vitro* toxicity of TiO_2 nanoparticles against normal human lung cells BEAS-2B (a) and the morphological changes in control (b) and TiO_2 nanoparticles treated cells