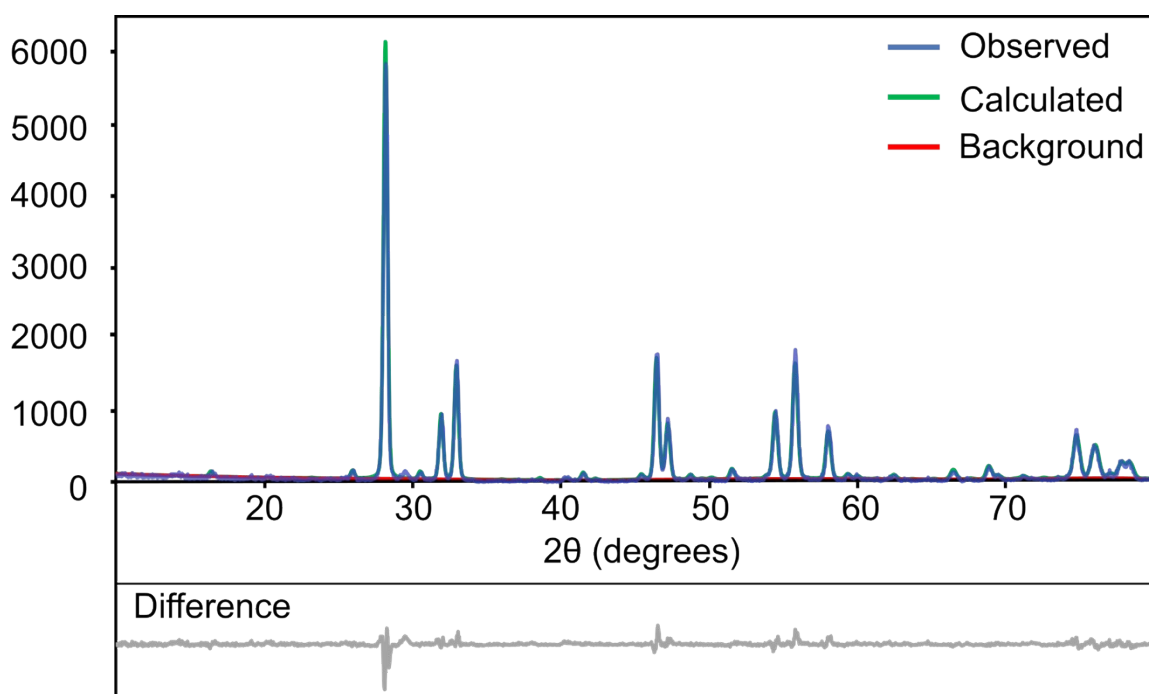


## Electronic Supporting Information

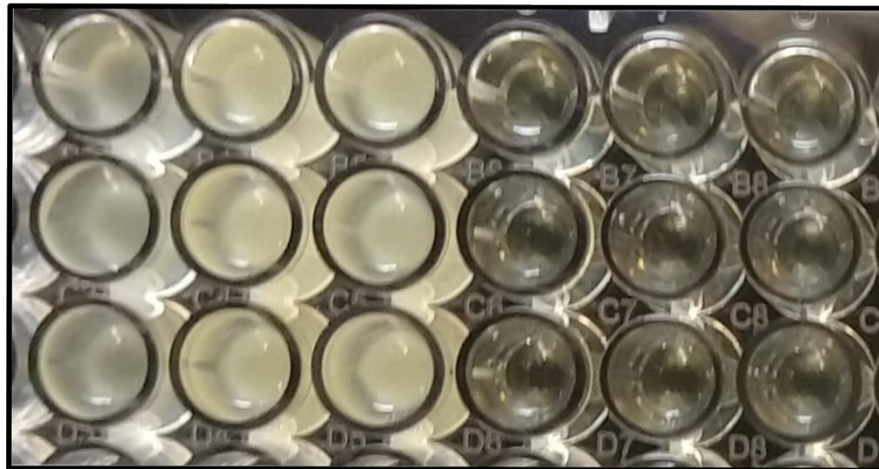
Bi<sub>2</sub>O<sub>3</sub> nanoparticles exhibit potent broad-spectrum antimicrobial activity and the ability to overcome Ag-, ciprofloxacin- and meropenem-resistance in *P. aeruginosa*: the next silver bullet of metal antimicrobials?

Bishnu D. Pant, Bogdan M. Benin, Nalin Abeydeera<sup>1</sup>, Min-Ho Kim, Songping D. Huang



**Figure S1.** Rietveld refinement of bulk Bi<sub>2</sub>O<sub>3</sub>. Reference pattern calculated from ICSD#28443.

a

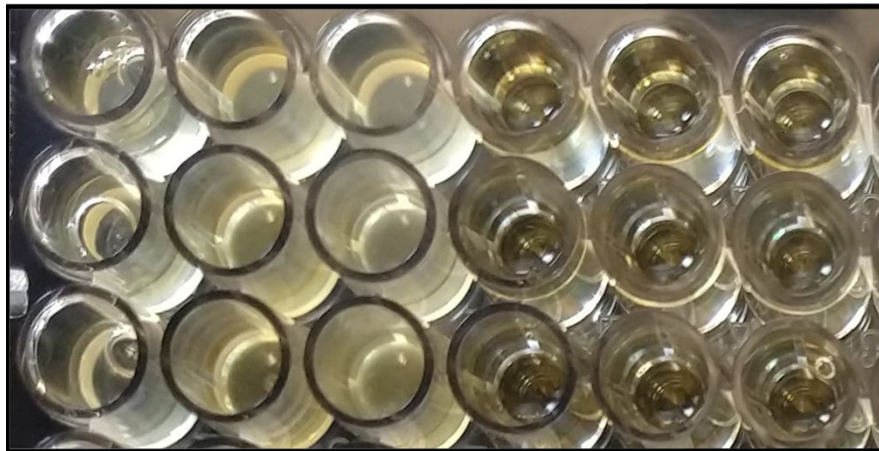


Control 1.5 2.0 2.5 3.0 3.5  
Concentration of Bi<sub>2</sub>O<sub>3</sub> NPs (µg/mL)

0.8561	0.8322	0.4629	0.0063	0.0042	0.0030
0.8735	0.7934	0.4576	0.0069	0.0039	0.0019
0.8356	0.8061	0.4425	0.0078	0.0034	0.0017
<b>Control</b>	<b>1.5</b>	<b>2.0</b>	<b>2.5</b>	<b>3.0</b>	<b>3.5</b>

Concentration of Bi<sub>2</sub>O<sub>3</sub> NPs (µg/ml)

b

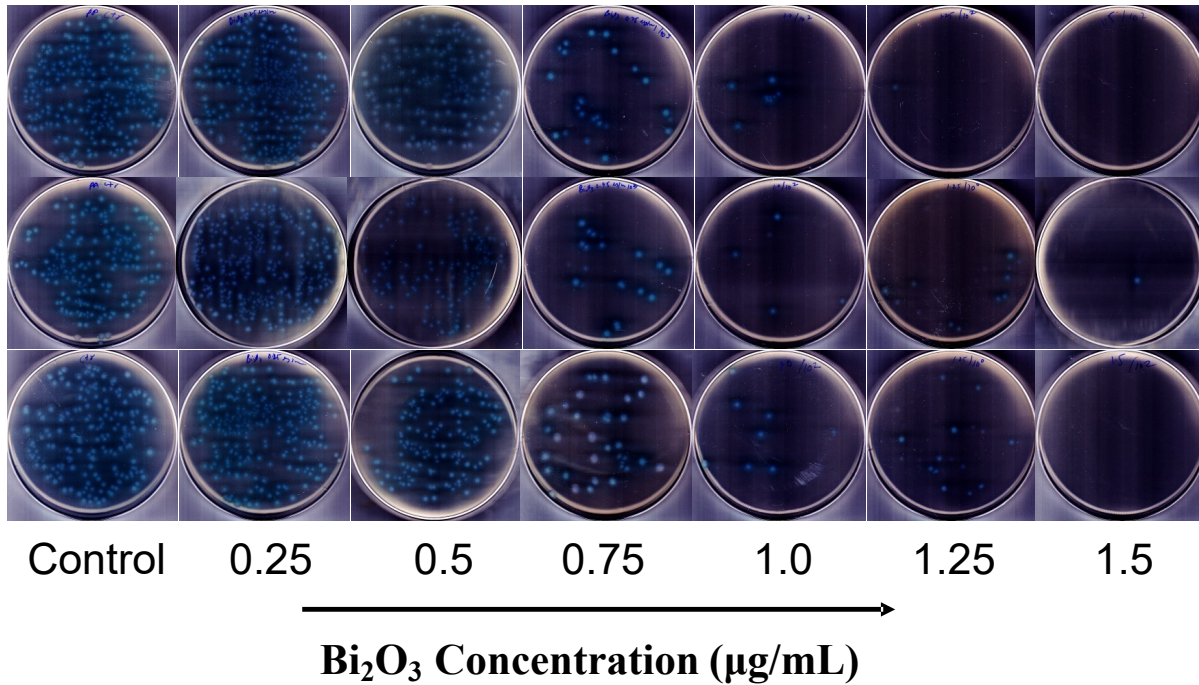
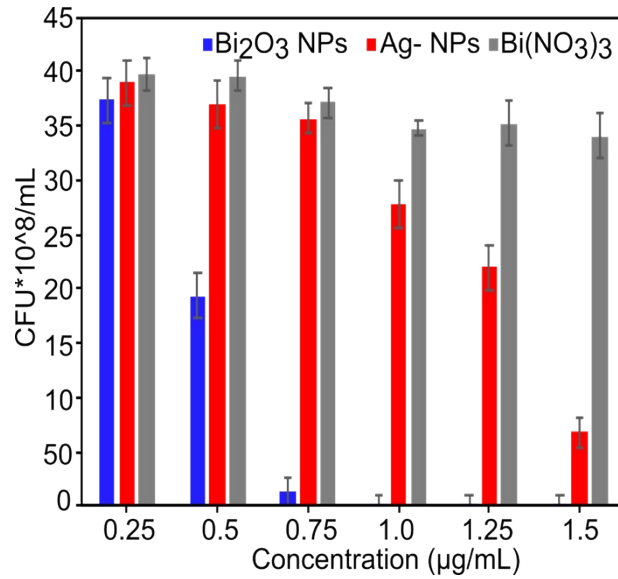


Control 0.25 0.5 0.75 1.0 1.25  
Concentration of Bi<sub>2</sub>O<sub>3</sub> NPs (µg/mL)

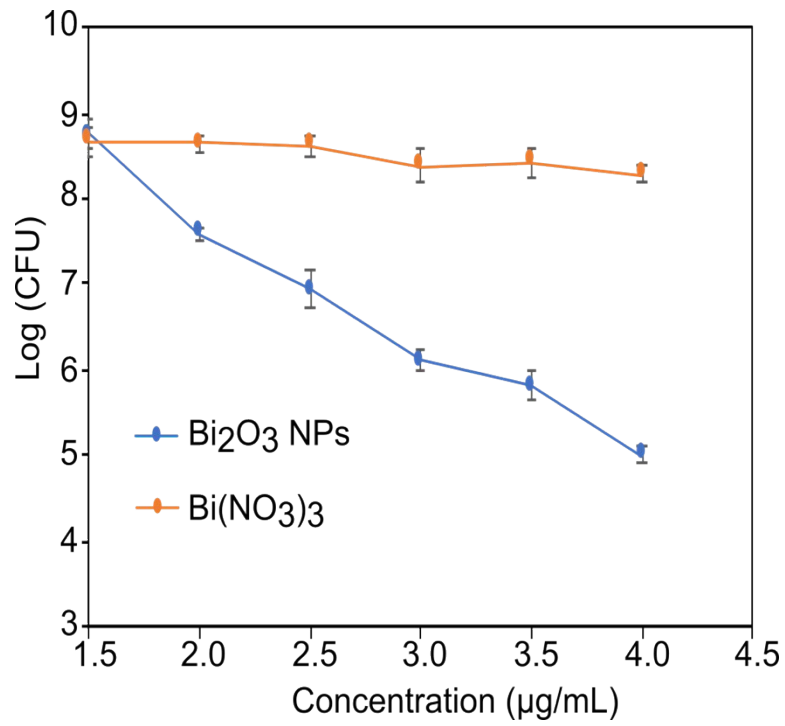
0.8183	0.7736	0.3929	0.0046	0.0035	0.0016
0.7875	0.7811	0.3577	0.0056	0.0048	0.0008
0.7761	0.7525	0.3625	0.0048	0.0031	0.0019
<b>Control</b>	<b>0.25</b>	<b>0.5</b>	<b>0.75</b>	<b>1.0</b>	<b>1.25</b>

Concentration of Bi<sub>2</sub>O<sub>3</sub> NPs (µg/ml)

**Figure S2.** Representative images and un-processed raw optical density values of MIC test of Bi<sub>2</sub>O<sub>3</sub>-NPs, against (a) SA and (b) PA.



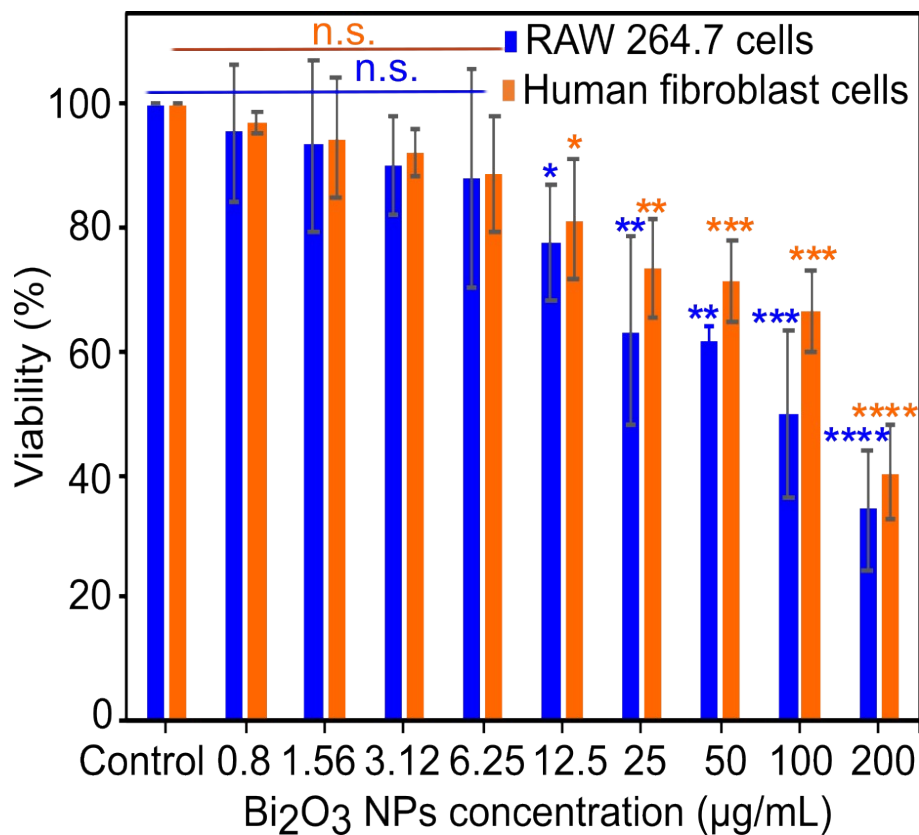
**Figure S3.** Representative plot of CFU enumeration results of Bi<sub>2</sub>O<sub>3</sub>-NPs, against PA showing LD<sub>50</sub> = 0.5 µg/mL and representative images of CFU enumeration results of Bi<sub>2</sub>O<sub>3</sub>-NPs against PA.



**Figure S4.** CFU enumeration results of Bi<sub>2</sub>O<sub>3</sub> NPs for SA.

**Table S1.** MIC of Bi<sub>2</sub>O<sub>3</sub> NPs against Ag-, ciprofloxacin-, and meropenem-resistant PA.

Bacteria	MIC (µg/ml)
PA <sub>Ag</sub>	1.0
PA <sub>cip</sub>	0.75
PA <sub>mero</sub>	1.25



**Figure S5.** Cell viability curves of Bi<sub>2</sub>O<sub>3</sub> NPs against HDFs (a) RAW 264.7 cells and human fibroblast cells. (n.s. = not significant), \* ( $p < 0.05$ ), \*\* ( $p < 0.01$ ), \*\*\* ( $p < 0.001$ ), and \*\*\*\* ( $p < 0.0001$ ).

**Table S2.** FIC index of Bi<sub>2</sub>O<sub>3</sub> NPs in combination with meropenem antibiotic.

MIC (µg/mL) against DRPA				FIC index
Mero	Mero+	Bi <sub>2</sub> O <sub>3</sub>	Bi <sub>2</sub> O <sub>3</sub> +mero	0.45
	Bi <sub>2</sub> O <sub>3</sub>			
2.0	0.25	0.75	0.25	