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## **Supplementary Information**

## Green Synthesized Multifunctional Ag@Fe<sub>2</sub>O<sub>3</sub> nanocomposites for excellent Antibacterial, Antifungal and Anticancer Properties

Sameer. Kulkarni, Mangesh. Jadhav, Prasad. Raikar, Delicia A. Barretto, Shyam Kumar. Vootla and U. S. Raikar



Fig.S1: Tauc plot of Fe<sub>2</sub>O<sub>3</sub> nanoparticles.



Fig.S2: Tauc plot of Ag @ Fe<sub>2</sub>O<sub>3</sub> nanoparticles.

Concentrat	Staphylococci	us aureus	Escherichia coli		Candida albicans					
ion										
	Zone of Inhibition in mm (Mean $\pm$ SD)									
	Fe <sub>2</sub> O <sub>3</sub> **	Ag@	Fe <sub>2</sub> O <sub>3</sub> **	Ag@	Fe <sub>2</sub> O <sub>3</sub> **	Ag@				
		Fe <sub>2</sub> O <sub>3</sub> **		Fe <sub>2</sub> O <sub>3</sub> **		Fe <sub>2</sub> O <sub>3</sub> **				
$20 \mu_{\rm g/ml}$	0.00±0.00	11.00±1.00	0.00±0.00	$10.33 \pm 0.58$	0.00±0.00	0.00±0.00				
$40 \mu_{\rm g/ml}$	0.00±0.00	$12.00 \pm 1.00$	$10.00 \pm 0.00$	$12.00 \pm 1.00$	0.00±0.00	0.00±0.00				
$60 \mu_{\rm g/ml}$	$10.33 \pm 0.58$	$13.33 \pm 0.58$	$10.67 \pm 0.58$	$12.33 \pm 0.58$	0.00±0.00	$10.33 \pm 0.58$				
$80 \mu_{\rm g/ml}$	11.33 ±0.58	$14.00 \pm 1.00$	$12.00 \pm 0.00$	$14.00 \pm 1.00$	0.00±0.00	$12.00 \pm 1.00$				
$100 \mu \text{g/ml}$	$12.00 \pm 0.00$	$15.00 \pm 1.00$	12.33 ±0.58	$15.00 \pm 1.00$	10.33±	13.33 ±0.58				
					0.58					

**\*\*** Correlation is significant at the 0.01 level (2-tailed)

Table. S3: Statistical data for Antimicrobial activity of  $Fe_2O_3$  & Ag@  $Fe_2O_3$  against S. aureus, E. coli, C. albicans.

MDA-MB-231													
Ag@Fe <sub>2</sub> O	3												
Conc.					% Inhibition			Average	SD				
1000	0.122	0.126	0.119		72.95	72.06	73.61	72.88	0.8				
500	0.139	0.139	0.131		69.18	69.18	70.95	69.77	1.0				
250	0.147	0.15	0.145		67.41	66.74	67.85	67.33	0.6				
125	0.234	0.23	0.234		48.12	49.00	48.12	48.41	0.5				
62.5	0.33	0.339	0.338		26.83	24.83	25.06	25.57	1.1				
Control	0.451	0.454	0.449	0.451									
				IC50	137.21	132.03	136.94	135.39	2.9				
<b>5 0</b>													
Conc.					% Inhibition			Average	SD				
1000	0.165	0.161	0.158		63.41	64.30	64.97	64.23	0.8				
500	0.215	0.216	0.218		52.33	52.11	51.66	52.03	0.3				
250	0.278	0.281	0.28		38.36	37.69	37.92	37.99	0.3				
125	0.301	0.307	0.303		33.26	31.93	32.82	32.67	0.7				
62.5	0.365	0.351	0.356		19.07	22.17	21.06	20.77	1.6				
Control	0.451	0.454	0.449	0.451									
				IC50	458.33	463.46	469.76	463.85	5.7				

Table.S4: Statistical data for Anticancer activity of Fe<sub>2</sub>O<sub>3</sub> & Ag@ Fe<sub>2</sub>O<sub>3</sub> nanoparticles against MDA – MB – 231 cell line.



Fig . S5 : Image of NIH3T3 normal cell line (a) control, (b) treated with Fe<sub>2</sub>O<sub>3</sub> nanoparticles, (c) with Ag@Fe<sub>2</sub>O<sub>3</sub> nanocomposites (d) cytotoxic effect of synthesized nanocomposites on NIH3T3 normal cell line



 $\label{eq:Fig.S6:Cleavage study of pBR322 (E. coli) DNA Lane 1. Normal DNA. Lane 2. DNA treated with 20 \mu g / ml of Fe_2O_3 nanoparticles. Lane 3. DNA treated with 20 \mu g / ml of Ag @ Fe_2O_3 nanoparticles.$