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## **Electronic Supplementary Information**

## Self-Assembled Superparamagnetic Nanocomposite-Labelled Cells for Noninvasive, Controlled, Targeted Delivery and Therapy

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**Figure S1.** Energy Dispersive Spectra (EDS) of (a) HAIO10, (b) HAIO20, (c) HAIO30 (d) HAIO40 and (e) HAIO50 from TEM grid.



**Figure S2.** Energy Dispersive Spectra (EDS) of a) HAIO10 b) HAIO20 c) HAIO30 d) HAIO40 e) HAIO50 from SEM stub.



**Figure S3.** X-ray Diffraction (XRD) pattern of a) HAIO10 b) HAIO30 c) HAIO70 d) HAIO90 [HA PDF= 00-009- 0432, IO PDF= 01-071-6336].



**Figure S4.** Fourier Transform Infra red Spectra (FTIR) of various weight percentage of HAIOs a) IO b) HA c) HAIO50.



**Figure S5.** Fourier Transform Infra red Spectra (FTIR) of various weight percentage of HAIOs a) HAIO10 b) HAIO30 c) HAIO70 d) HAIO90.



Figure S6. The Zeta potential measurement of a) HAIO50 b) IO.



**Figure S7.** MTT test of HeLa cells treated with 0.75mg/ml & 1.5mg/ml of IO and varying HAIO nanocomposites.

Concentrations	% Hemolysis of samples			
(mg)	HAIO10	HAIO30	HAIO50	
0.1	0.704±.076	0.704±0.076	0.792±0.132	
0.3	0.792±.227	0.792±0.132	0.968±0.202	
0.5	0.880±.201	0.880±0.077	1.056±0.132	
NEG: Control PEG 40wt%	0.704±0.076			
POS: Control Triton-X 100 10wt%	75.088±0.861			

Table S8. Percentage hemolysis for 0.1mg, 0.3mg and 0.5mg of varying HAIO preparations



**Figure S9.** Light Micrographs of HeLa cells incubated with 120µg of HAIO50 (4 hours) - A) Control and B) stained with Prussian Blue.

Time	Control		HAIO50 120µg		HAIO50 240µg		HAIO50 480µg	
(min)	<b>P1</b>	P2	P1	P2	P1	P2	P1	P2
0	99.2	0.8	81.4	3.8	61.9	8.9	73.5	15.3
5	99.2	0.8	94.2	5.7	70	15.5	64.8	24.7
10	99.5	0.5	78.4	6	63.4	34	61.3	38.6
15	99.6	0.4	90.6	9.4	59.2	40.7	43.2	52.8

**Table S10.** Percentage Gated Population of P1 & P2: time & dose based variance clearly expressed. P1= cells gated as Control indicated by no change in values, P2= Cells in interaction with HAIO50 indicated by linearly correlated intensity of SSC channel.



**Figure S11.** FSC vs SSC plots of Flow Cytometric measurement of granularity change in HeLa cells; A control, B & C are represents  $30\mu g$  &  $60\mu g$  of HAIO50 in contact with  $10^6$  cells and (i), (ii), (iii) & (iv) indicated analysis at time points - 0,5, 10 & 15 min.  $\blacksquare$ P1= cells gated as Control indicated by no change in values  $\blacksquare$ P2= Cells in interaction with HAIO50.

Time (min)	Contr	Control		HAIO50 30µg		HAIO50 60µg	
	P1	P2	P1	P2	P1	P2	
0	99.2	0.8	99.6	0.4	99.2	0.8	
5	99.2	0.8	99.6	0.4	99.5	0.5	
10	99.5	0.5	99.8	0.2	98.1	0.1	
15	99.6	0.4	99.4	0.6	98.2	1.2	

**Table S12.** Percentage marked Population of P1 & P2: time & dose based variance clearly expressed. P1= cells marked as Control indicated by no change in values, P2= Cells in interaction with HAIO50 indicated by linearly correlated intensity of SSC channel.



**Figure S13.** The Acridine Orange (AO) pre-stained HeLa cells were incubated with various concentrations of HAIO50 for 15min and magnetically separated. Supernatant collected and the corresponding pellets were re-dispersed in PBS buffer. Images of dispersion were taken on UV transilluminator.



**Figure S14.** Giemsa Stained HeLa cells: (a) cells alone indicated by clear blue spheres (b) Magnetically separated HAIO50 pellet containing cells identical to (a); and (c) HAIO50 alone.