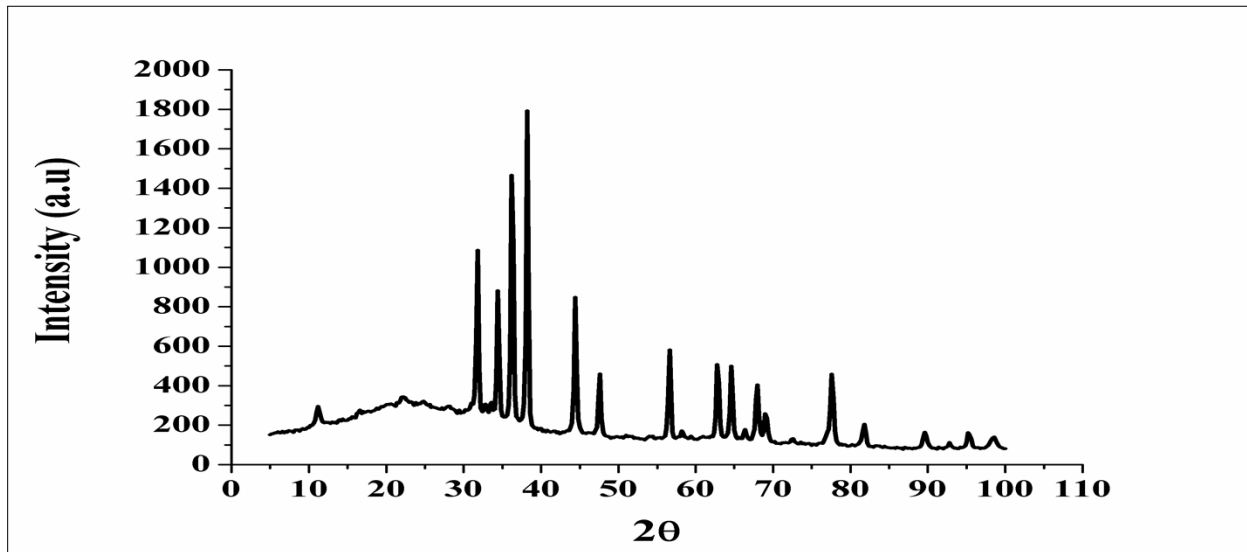
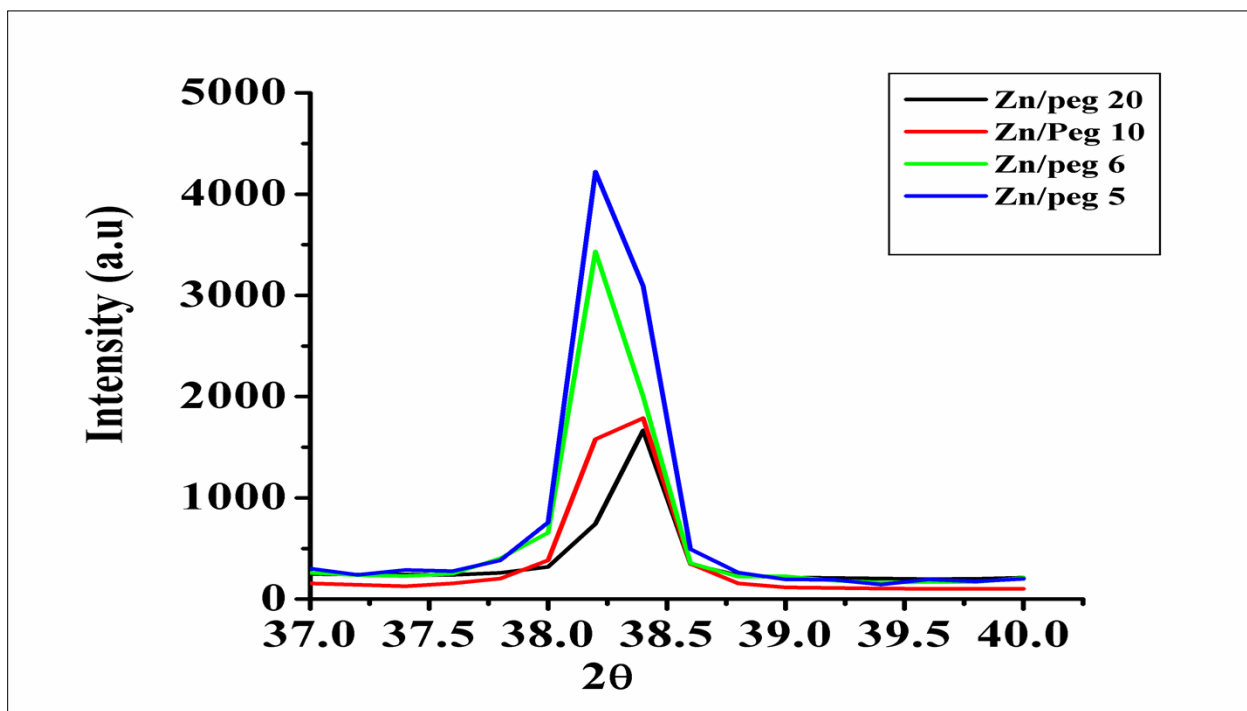


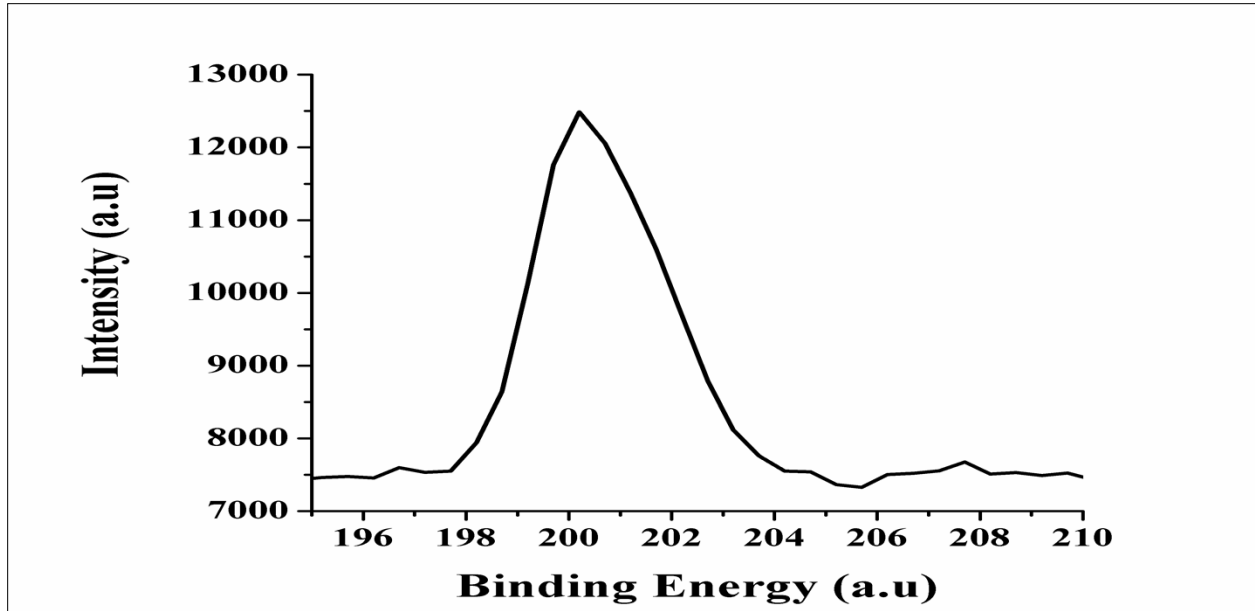
Supporting Information:



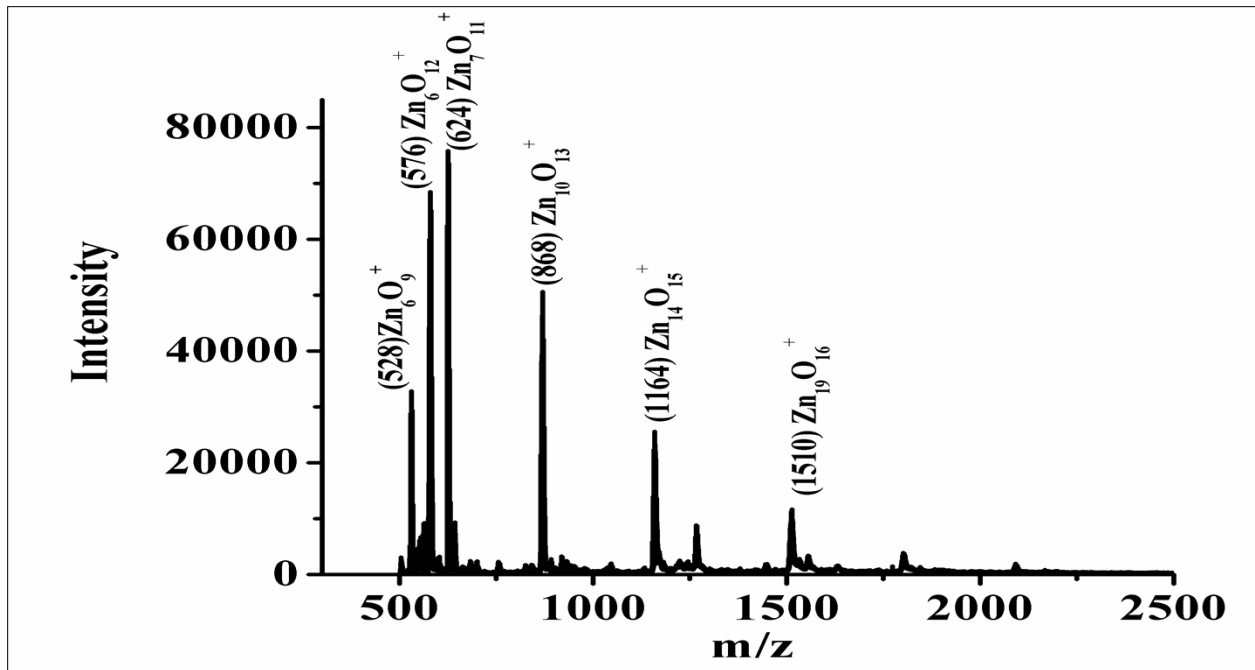
S1: X-Ray diffraction patterns of 5% Au-ZnO nanocomposites prepared at Zn/PEG ratio of 3.



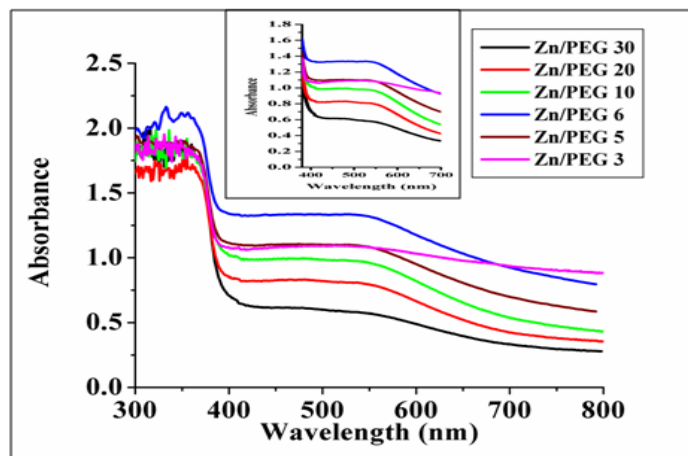
S2: X-Ray diffraction patterns of Au peak at $2\theta = 38.2$ for 5% Au-ZnO nanocomposites prepared at different Zn/PEG ratio.



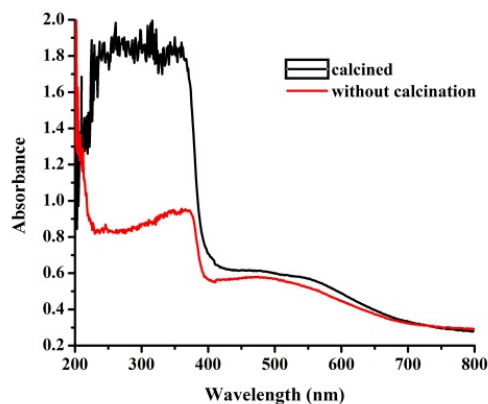
S3: Photoelectron spectrum of Cl 2p_{3/2} for 5% Au-ZnO prepared at Zn/PEG ratio of 30.



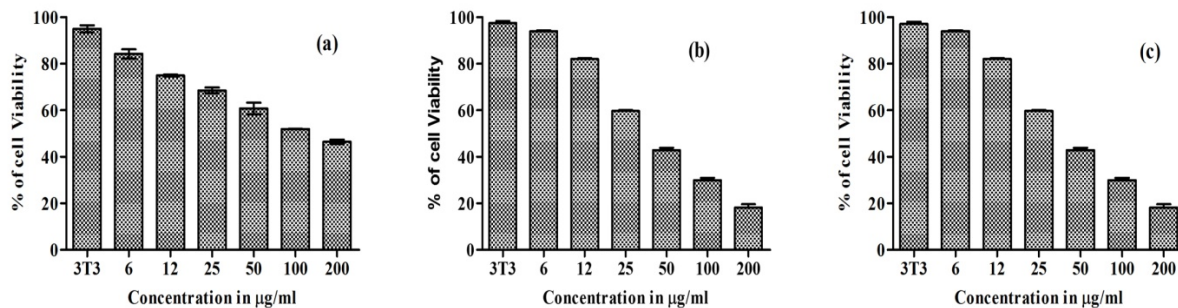
S4: MALDI-TOF of 0.5% Au-ZnO prepared at Zn/PEG ratio of 5.



S5. DRS UV-Vis spectra of 5% Au-ZnO at different Zn/PEG ratio.



S6. A comparative UV-Vis DRS of ZnO/Au from Zn/PEG ratio of 30 with 5% Au before and after calcination.



S7. Percentage cell Toxicity of (a) Pure ZnO, (b) 1% Au/ZnO, (c) 5% Au with Same Zn/PEG ratio of 5 as a function of their concentration. 3T3 fibroblast cells used as normal control with a concentration of 250 µg/ml

T1: Intensity ratio of XRD pattern of AuClO with respect to Au (based on peak heights).

Zn/PEG ratio	AuClO, 2θ=12	Au, 2θ= 38	AuClO/Au
30	416	2395	0.173*
20	276	1645	0.167
10	270	2206	0.122
6	383	3710	0.103
5	342	5715	0.059

- The value is much higher in precalcined samples, i.e. 0.6

T2: Intensity ratio of various Au clusters as seen by MALDI-TOF of Au-ZnO nanocomposites.

Name of Samples	Zn/PEG	Intensity					Au ₃ /Au ₅	Au ₃ /Au ₇	Au ₃ /Au ₉	Au ₃ /Au ₁₁
		Au ₃	Au ₅	Au ₇	Au ₉	Au ₁₁				
1% Au-ZnO	30	7032	765	440	348		9.19	15.98	20.21	
1% Au-ZnO	5	21279	7506	4858	1187		2.83	4.38	17.92	
5% Au-ZnO	5	149413	39986	22574	20400	5940	3.73	6.62	7.32	25.15
5% Au-ZnO	6	127628	33514	17051	14992	6762	3.81	7.48	8.51	18.87
5% Au-ZnO	10	12273	4404	1888	987		2.78	6.51	12.43	

T3. A comparative chart of Percentage cell viability of ZnO nanoparticles against different cancer cells

S.No	Name of the Cell line	Cell quantity (cells/well)	Maximum Concentration of sample used	Percentage Cell Viability*	References
1	HepG2	1 × 10 ⁴	15 µg/mL	39 (52.00)	Akhtar <i>et al.</i> (ref.55)
	A549	1 × 10 ⁴	15 µg/mL	47 (62.67)	
	BEAS-2B	1 × 10 ⁴	15 µg/mL	33 (44.00)	
2	HLaC 78	1 × 10 ⁴	20 µg/mL	~42 (42.00)	Hackenberg <i>et al.</i> (ref.56)
	UD-SCC 7A	1 × 10 ⁴	20 µg/mL	~50 (50.00)	
	pOMCs	1 × 10 ⁴	20 µg/mL	~48 (48.00)	
3	A549	1 × 10 ⁴	350 µg/mL	~20 (**)	Chen <i>et al.</i> (ref.57)
4	U87 cells	1 × 10 ⁴	200 µg/mL	~75 (**)	Wahab <i>et al.</i> (ref.58)
	HeLa	1 × 10 ⁴	200 µg/mL	~79 (**)	
5	MCF 7	1 × 10 ⁵	200 µg/mL	~46	Present work

*Values in parenthesis normalized for a maximum of 200 µg/mL of nanoagents and constant cell quantity of 1 × 10⁵ cells/well; **cannot be calculated for pure ZnO efficacy due to lack of experimental data