Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Counterion Coupled (COCO) Gemini Surfactant Capped Ag/Au Alloy and Ag@Au Core-Shell Nanoparticles for Cancer Therapy

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Table S1. Synthesis conditions for AgNPs with different sizes.

AgNPs	Volume of $AgNO_3$ (ml)	Volume of COCOGS (ml)	Volume of KOH (ml)	Volume of $NaBH_4$ (ml)	Volume of H_2O (ml)	DLS Z-Average (d.nm)
Ag-1	2.5	2.5	1.0	2.5	41.5	27.3
Ag-2	0.25	2.5	1.0	2.5	44.35	40.5
Ag-3	2.5	7.5	1.5	10	18.5	98.3
Ag-4	2.5	2.5	1.0	5	42.2	62.4
Ag-5	2.5	2.5	0.5	2.5	42.0	90.3

Table S2. Zeta Potential values obtained from dynamic light scattering (DLS). All given errors are standard deviations

Nanoparticle	Zeta Potential (mV)	PDI
Ag-1	31.2 ± 1.6	0.85
Au	86.5 ± 1.5	0.64
Ag/Au-1	0.23 ± 0.02	0.44
Ag/Au-2	33.4 ± 1.5	0.52
Ag@Au-3	34.3 ± 1.4	0.43
Ag@Au-4	42.1 ± 1.2	0.48
Ag@Au-5	39.8 ± 1.0	0.54
Ag@Au-6	44.1 ± 1.5	0.68
Ag@Au-7	44.5 ± 1.8	0.46
Ag@Au-8	55.6 ± 1.7	0.55

Table S3. Treated with Au, Ag, Ag/Au-1, Ag/Au-2, and Ag@Au-3 to 8 at the series of concentrations for 24 hrs in both cancer (Hep2) and normal (NIH3T3) cells. Then further the Nanoparticles Ag/Au-1, Ag/Au-2 and Ag@Au-3 to 8 were treated with their IC50 concentrations for 14, 24 and 48 hrs of time to assess the potential cell growth inhibition.

Nanoparticles	IC50 at 24 hrs in Hep2 Cancer Cells	IC50 at 24 hrs in NIH3T3 Normal Cells
Ag-1	50 µg/ml	125 µg/ml
Au	75 µg/ml	125 µg/ml
Ag/Au-1	15 µg/ml	40 µg/ml
Ag/ Au-2	10 µg/ml	45 µg/ml
Ag@Au-3	5 µg/ml	30 µg/ml
Ag@Au-4	25 µg/ml	40 µg/ml
Ag@Au-5	35 µg/ml	50 µg/ml
Ag@Au-6	10 µg/ml	35 µg/ml
Ag@Au-7	20 µg/ml	45 µg/ml
Ag@Au-8	5 µg/ml	35 µg/ml

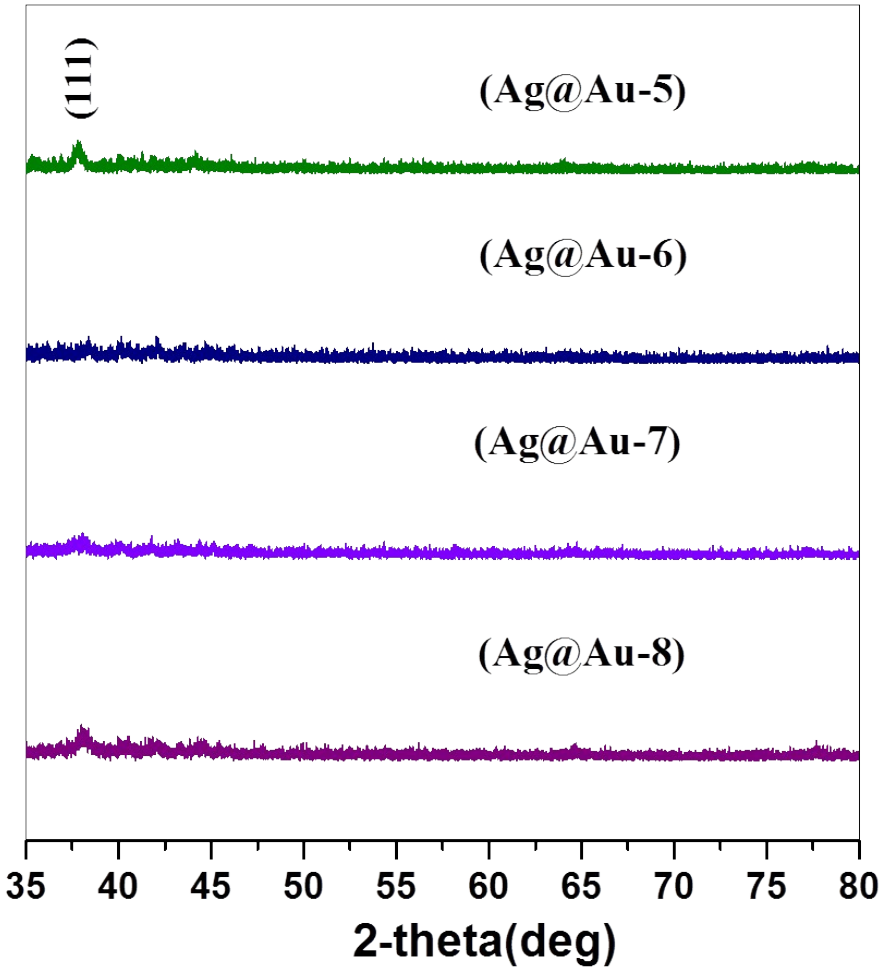

Fig. S1 XRD spectra of Ag@Au core-shell NPs.

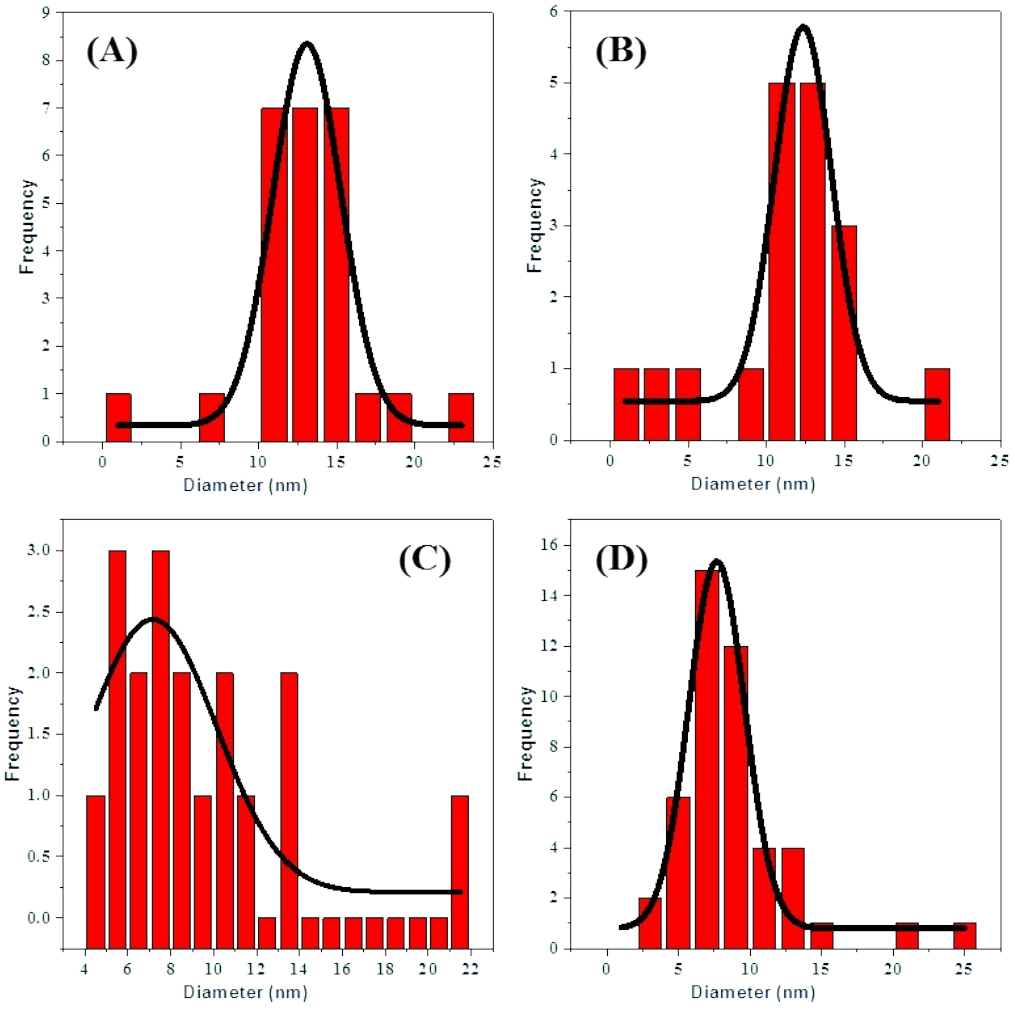

Fig. S2 Histogram showing the particle size distribution Pattern for corresponding TEM images (A-D) Ag@Au-5-8 core-shell NPs.

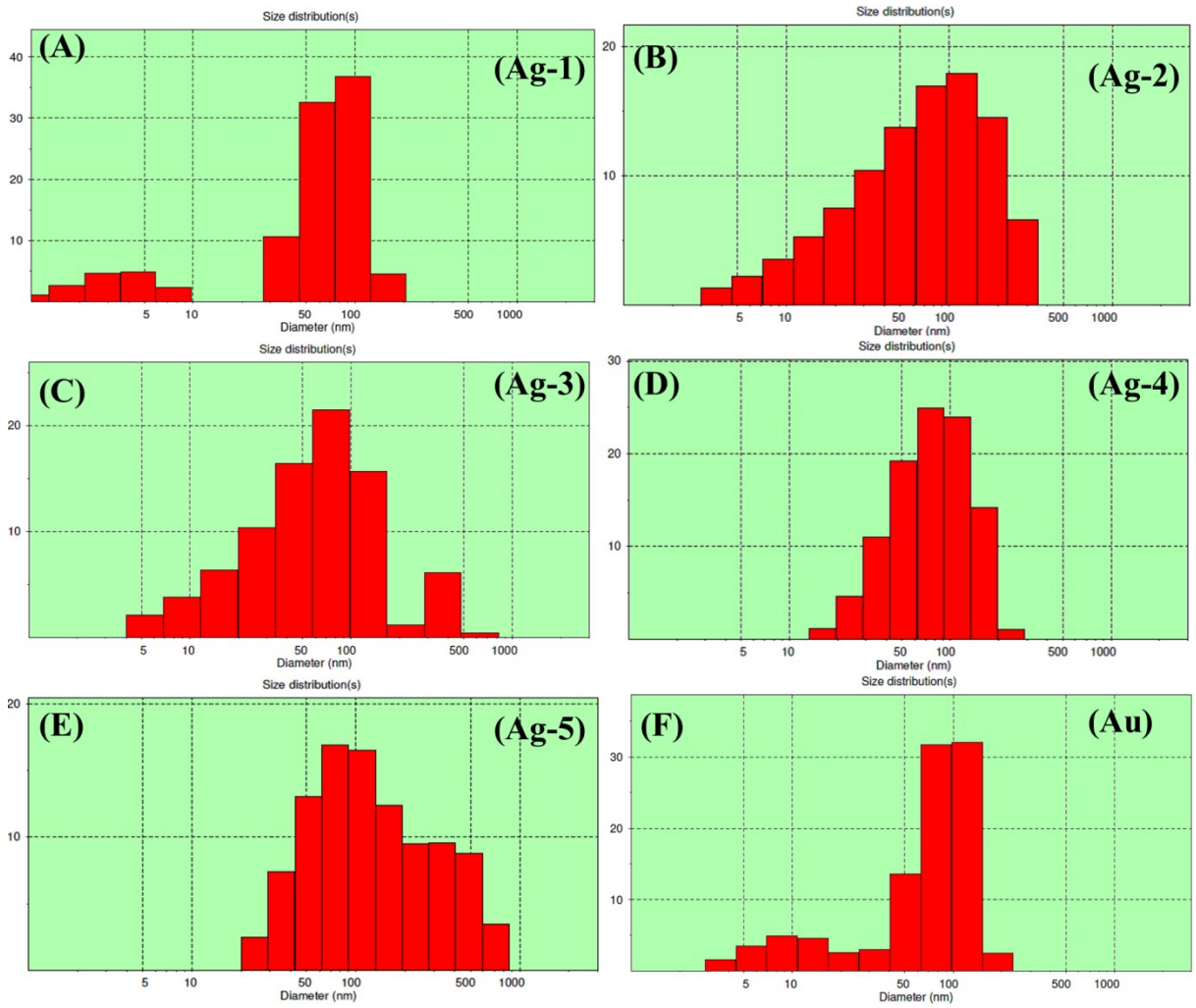

Fig. S3 The particle size distribution of Ag-1 to Ag-5 NPs (A-E) and AuNPs (F).

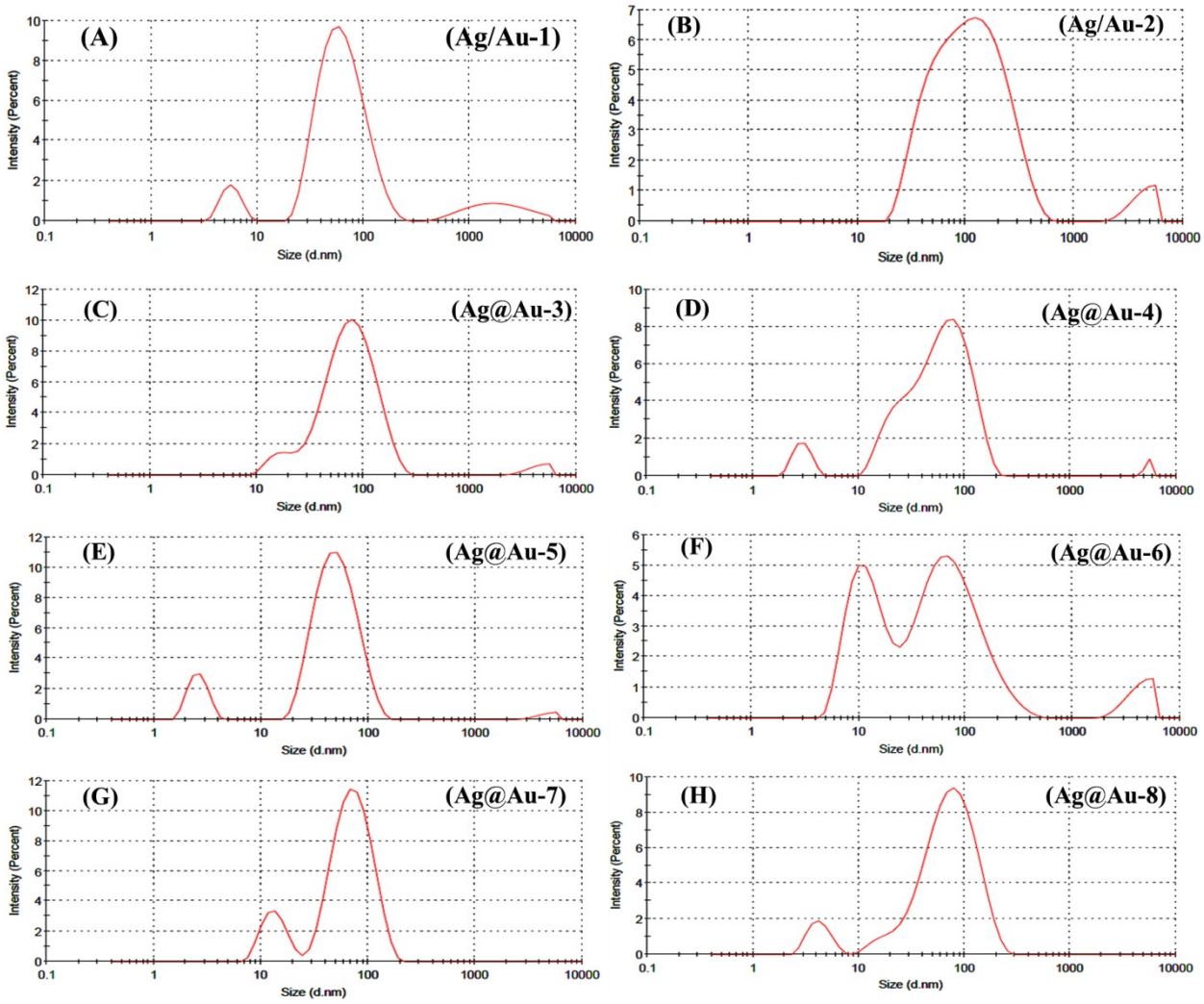

Fig. S4 The particle size distribution of Ag/Au alloy and Ag@Au core-shell NPs (A-H).

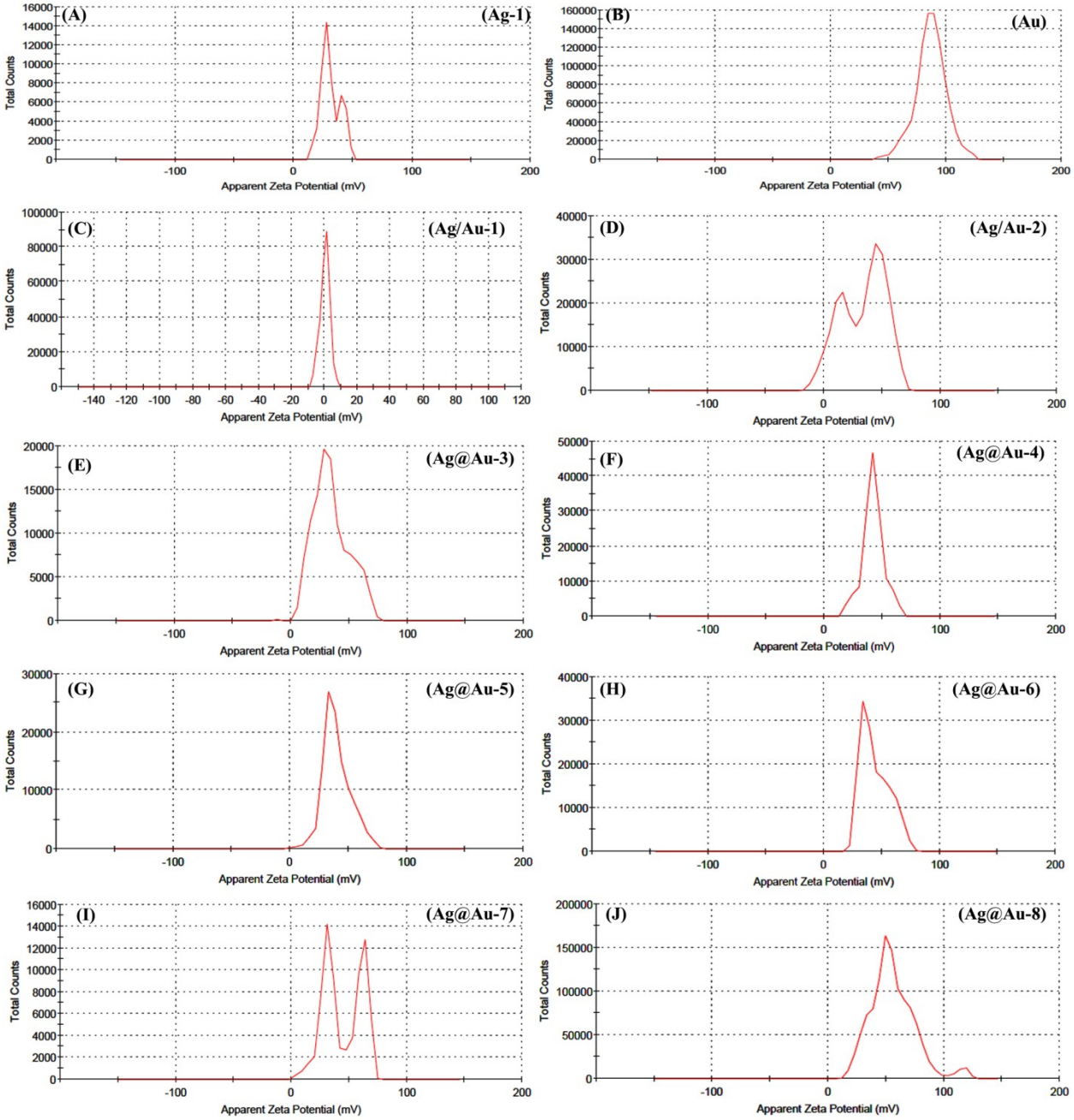

Fig. S5 The Zeta potential distribution graph of Ag-1NPs, AuNPs, Ag/Au alloy and Ag@Au core-shell NPs (A-H).

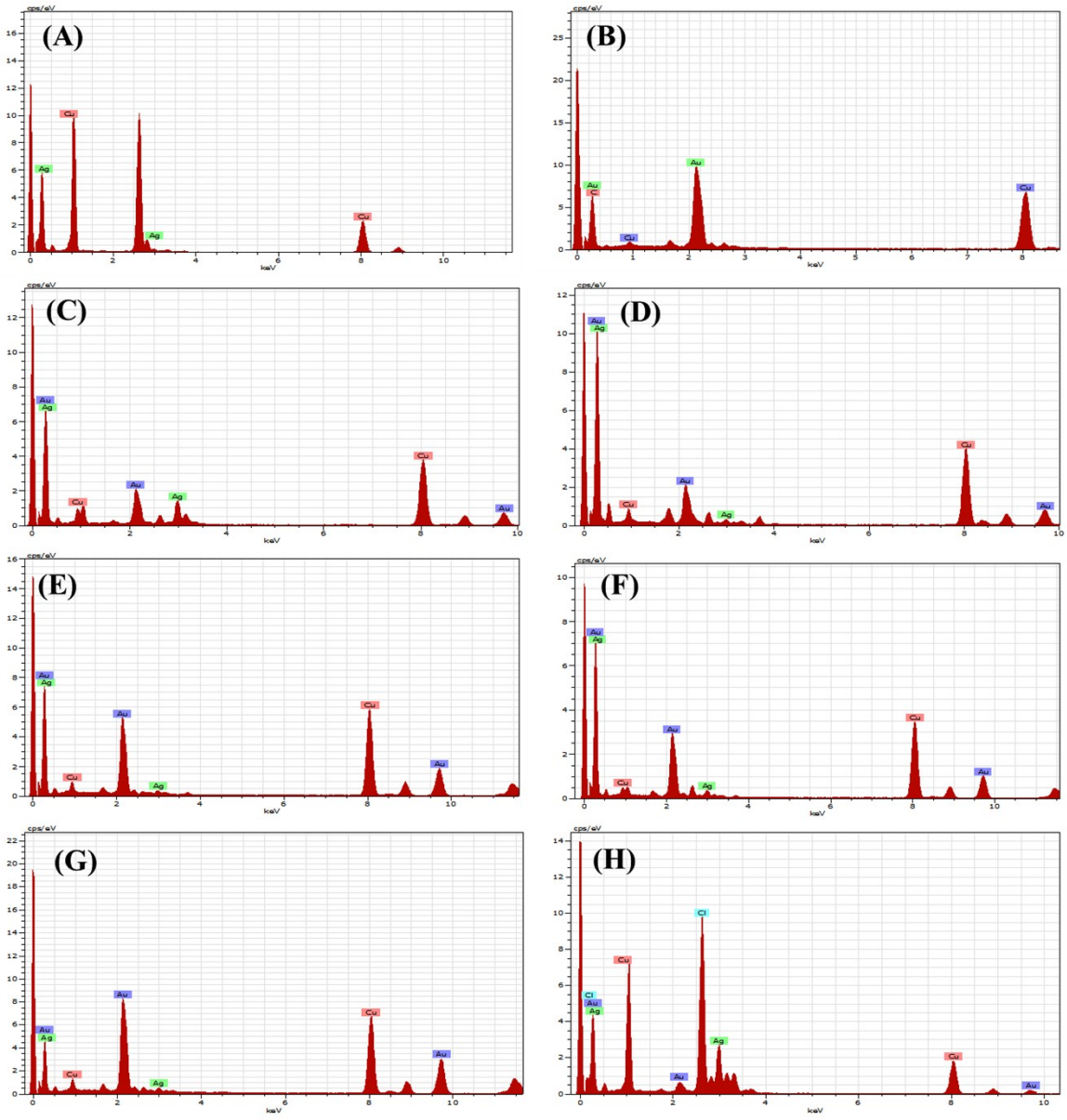

Fig. S6 EDX spectra of (A) Ag-1NPs (B) AuNPs (C-D) Ag/Au-1- 2 alloy NPs and (E-H) Ag@Au-3,4,7 and 8 core–shell NPs.