Electronic Supplementary Material (ESI) for Toxicology Research.

Supplement materials

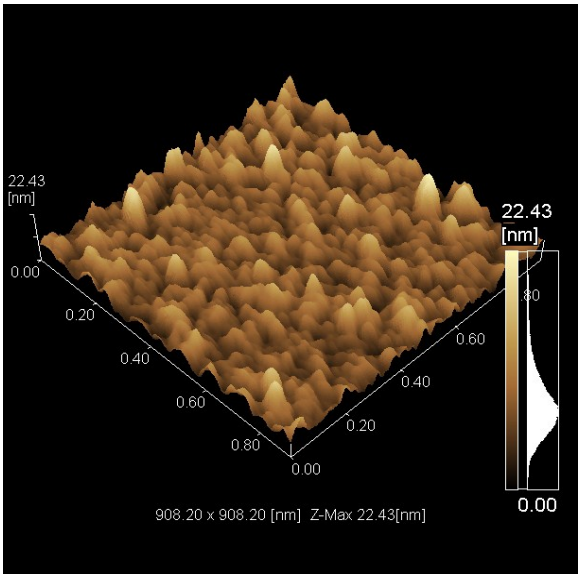

Figure S1 AFM graph of 25-nm Cu particles in 1% hydroxypropylmethyl cellulose solution.

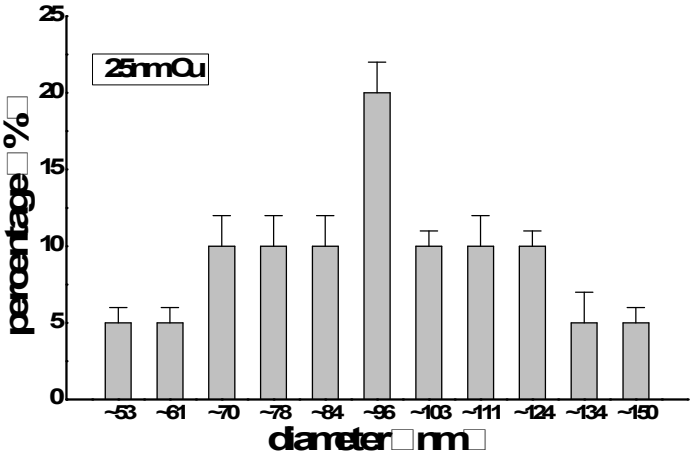

Figure S2 Size distribution of 25-nm Cu particles in 1% hydroxypropylmethyl cellulose Solution.

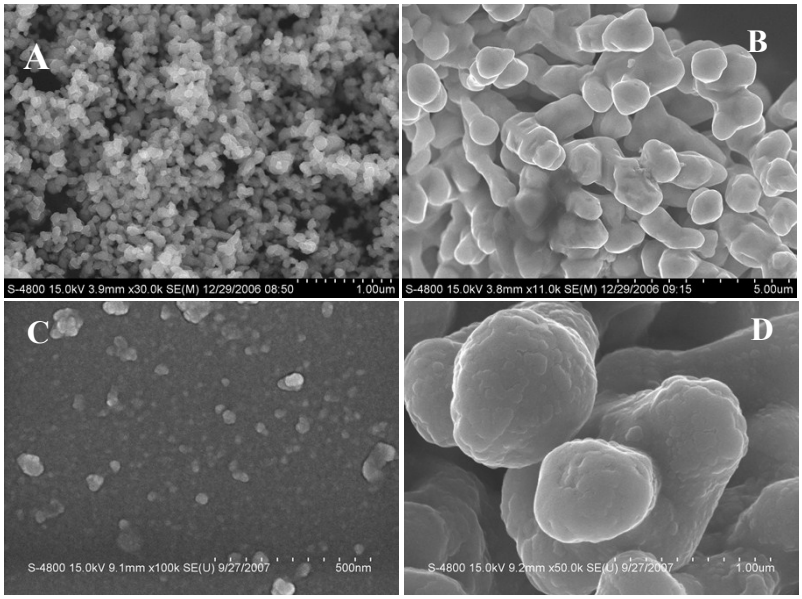

Figure S3 The scan electron microscope graphs of the copper particles

A.B CuNPs; B. D CuMPs; A. B Dispersion in the absolute alcohol; C.D Dispersion in the 1% HPMC solution

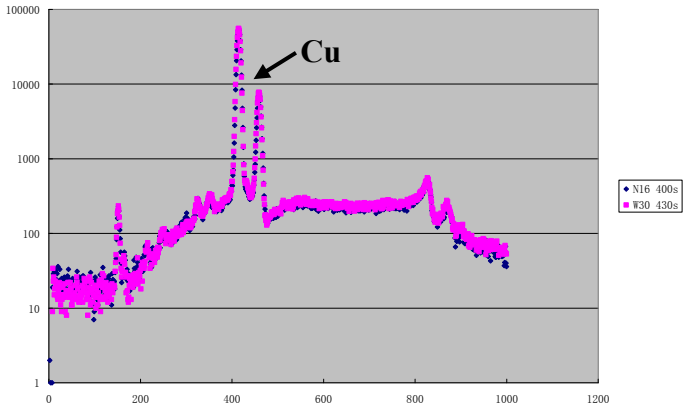

Figure S4 The X-ray fluorescence spectroscopy of the copper particles

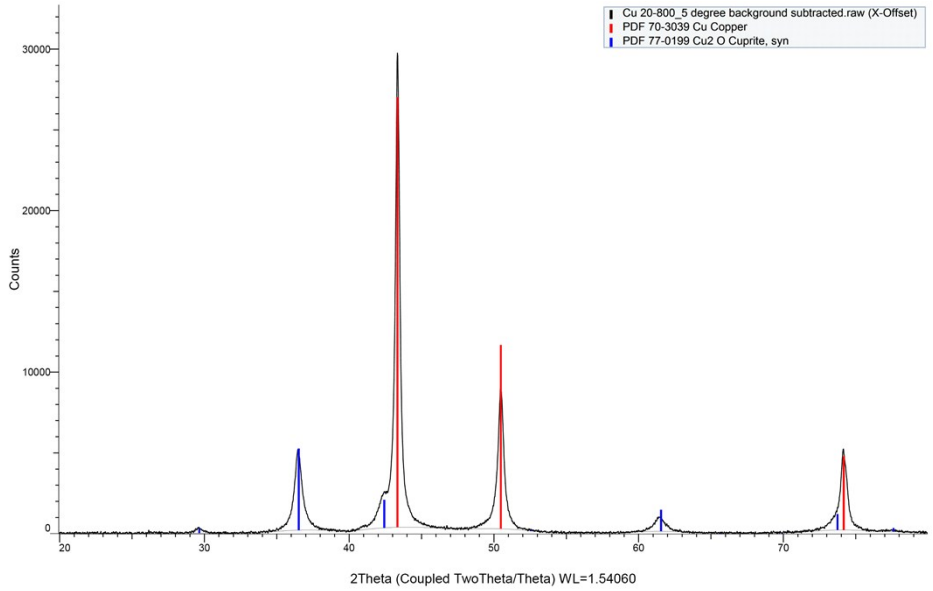

Figure S5 X-ray diffraction pattern of copper nanoparticles.

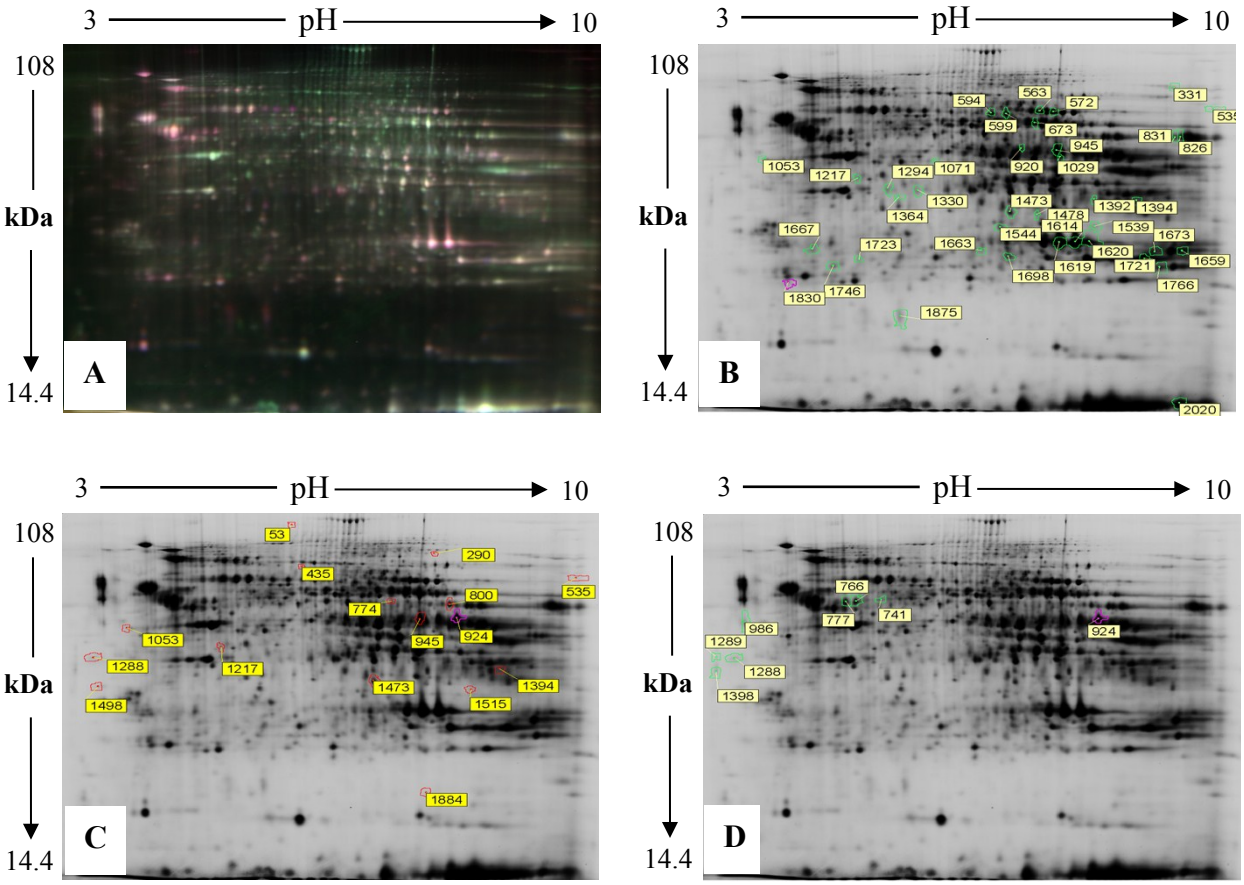

Figure S6 Liver differentially expressed protein spots displayed in two-dimensional DIGE images. Representative two-dimensional DIGE images from the control, Cu-NP and Cu-MP-treated rats for 5 days (A), 200mg/kg Cu-NP (B), 100mg/kg Cu-NP (C), and 200mg/kg Cu-MP (D) are presented. Numbered spots correspond to proteins exhibiting a modified expression level on Cu-NP treatment. Spot numbers correspond to those in Table 3 and Table 4.

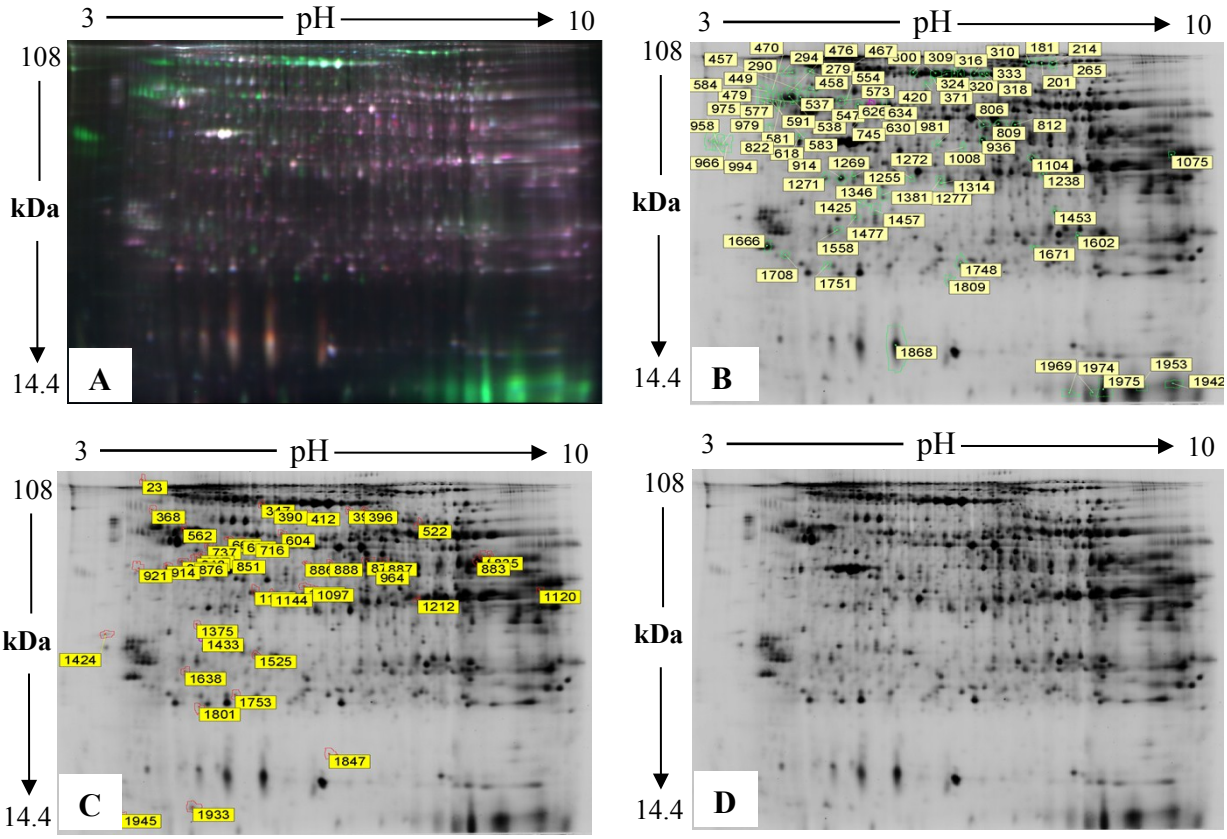

Figure S7 Kidney differentially expressed protein spots displayed in two-dimensional DIGE images. Representative two-dimensional DIGE images from the control,Cu-NP and Cu-MP-treated rats for 5 days (A), 200mg/kg Cu-NP (B), 100mg/kg Cu-NP (C), and 200mg/kg Cu-MP (D) are presented. Numbered spots correspond to proteins exhibiting a modified expression level on Cu-NP treatment. Spot numbers correspond to those in Table 5 and Table 6.

Table S1 Effects of copper particles on the body weight gains and organs weights (mean±SD)

Group	Control	Cu-MP	Cu-NP	
	1% HPMC	200 mg/kg	100 mg/kg	200 mg/kg
Body weight gain(g)	5.50±5.79	7.67 ±12.53	0.83±11.67	−54.33±15.24**
Liver(g)	7.186 ±0.394	7.222±0.494	6.808±1.186	7.129±0.951
kidney(g)	1.882±0.215	2.077±0.171	1.888±0.126	2.214±0.494*

Note: *p<0.05, ** p<0.01 (n=6 for all groups) compared with the control group.

Table S2 Effects of nano-sized copper on serum clinical chemistry parameters (mean±SD)

Parameters	Control	Cu-MP	Cu-NP(mg/kg)	
		200 mg/kg	100	200
ALT (U/l)	34.83 ± 2.64	37.00±3.29	27.50±6.28	131.67±104.94**
AST (U/l)	117.17 ± 24.90	118.67±12.29	103.67±6.19	1345.33±854.96**
ALP (U/l)	138.17 ± 16.45	137.50±19.28	133.50±23.30	95.17±86.64*
TP(g/l)	52.50 ± 2.35	53.57±1.74	51.45±1.41	70.30±20.81*
ALB(g/l)	33.00 ± 0.91	33.12±0.96	31.78±0.71	32.60±3.41
TCHOL(μmol/l)	1.43 ± 0.22	1.46±0.27	1.97±0.24*	1.09±0.17*
TG(mmol/l)	0.29 ± 0.07	0.29±0.06	0.54±0.06*	0.96±0.33**
GLU(mmol/l)	6.48 ± 1.39	4.79±0.86	4.86±0.40	4.81±1.93
TBA(μmol/l)	7.83 ± 0.60	9.15±1.84	8.93±2.53	17.88±8.80**
TBILI (μmol/l)	3.25 ± 0.73	3.47±0.55	4.03±1.54	88.77±65.40**
BUN(mmol/l)	5.23 ± 0.84	6.34±0.78	6.66±1.98	28.09±10.54**
CREA(μmol/l)	22.63± 3.65	23.87±3.24	23.50±4.39	270.63±97.77**

Note: compared with the control group,*p<0.05, ** p<0.01 (n=6 for all groups)