Supplementary Information

pH-assisted surface functionalization of selenium nanoparticles with curcumin to achieve enhanced cancer chemopreventive activity

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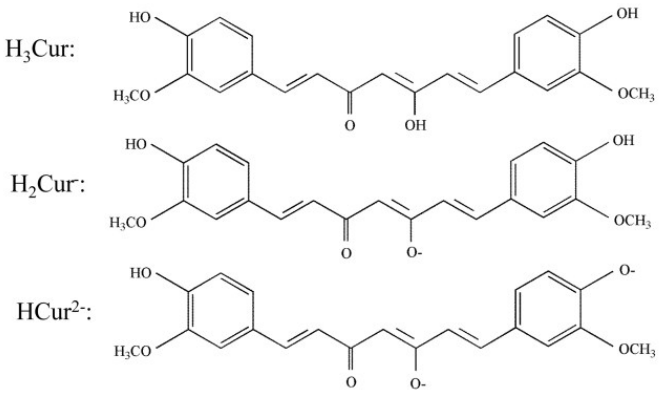

Figure S1. Proposed ionization of Cur in an alkaline aqueous solution (pH = 8.5).

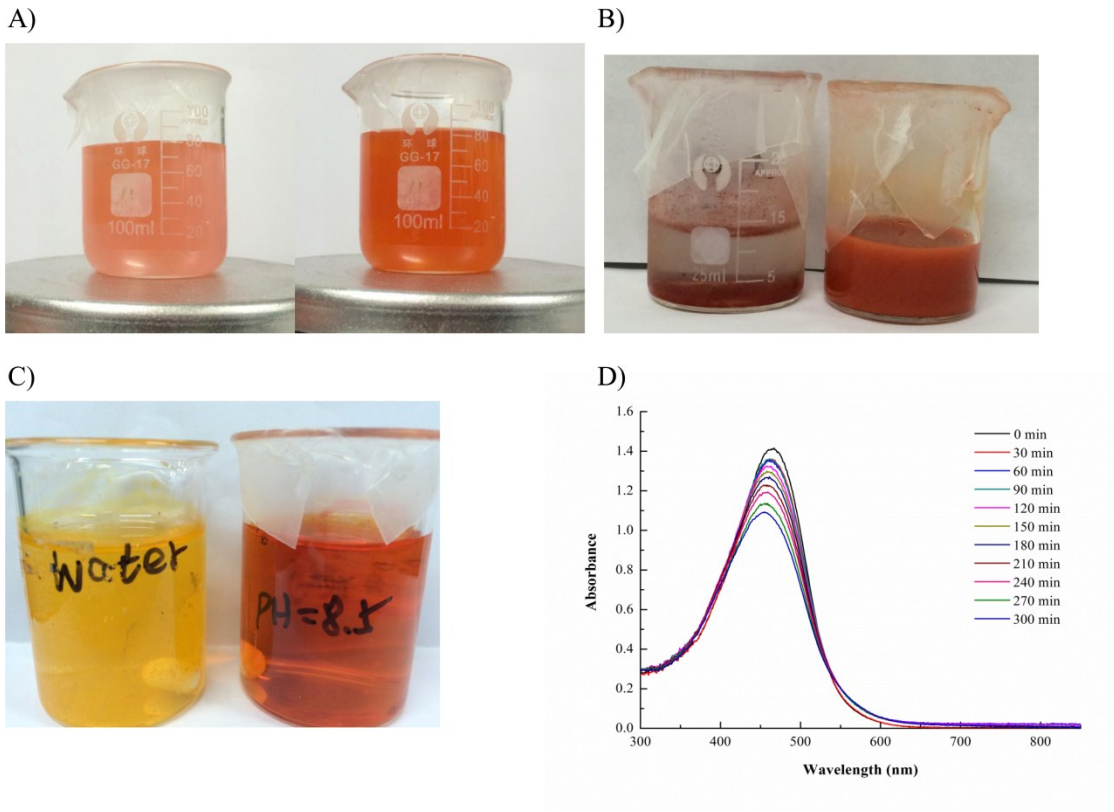

Figure S2. The aqueous solubility and stability of Se NPs, SeNPs@Cur and free Cur. A) Pictures of Se NPs (left) and SeNPs@Cur (right) solutions prepared freshly. B) Pictures of Se NPs (left) and SeNPs@Cur (right) solutions purified and concentrated. C) Pictures of Cur solutions prepared in water at pH values of 7.0 (left) and 8.5 (right). D) The UV-vis spectra of Cur recorded from 300 to 850 nm at fixed time intervals in an aqueous solution at pH 8.5.

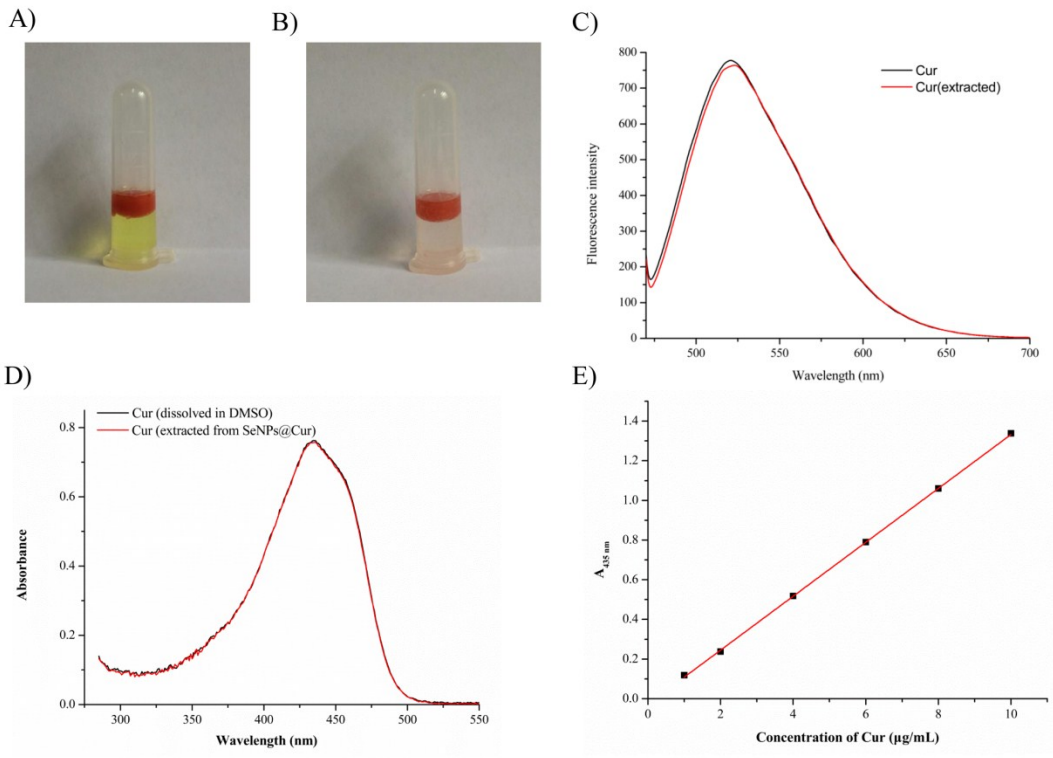

Figure S3. The extraction, spectral characterization and quantification of the Cur loaded on the surface of SeNPs@Cur. A) The picture of Cur solution that are being extracted with dichloromethane. B) The picture of Cur solution that has been extracted for several times. C) The fluorescence spectra of Cur extracted from SeNPs@Cur or dissolved in DMSO. D) The UV-vis spectra of Cur extracted from SeNPs@Cur or dissolved in DMSO. E) The calibration curve of Cur.

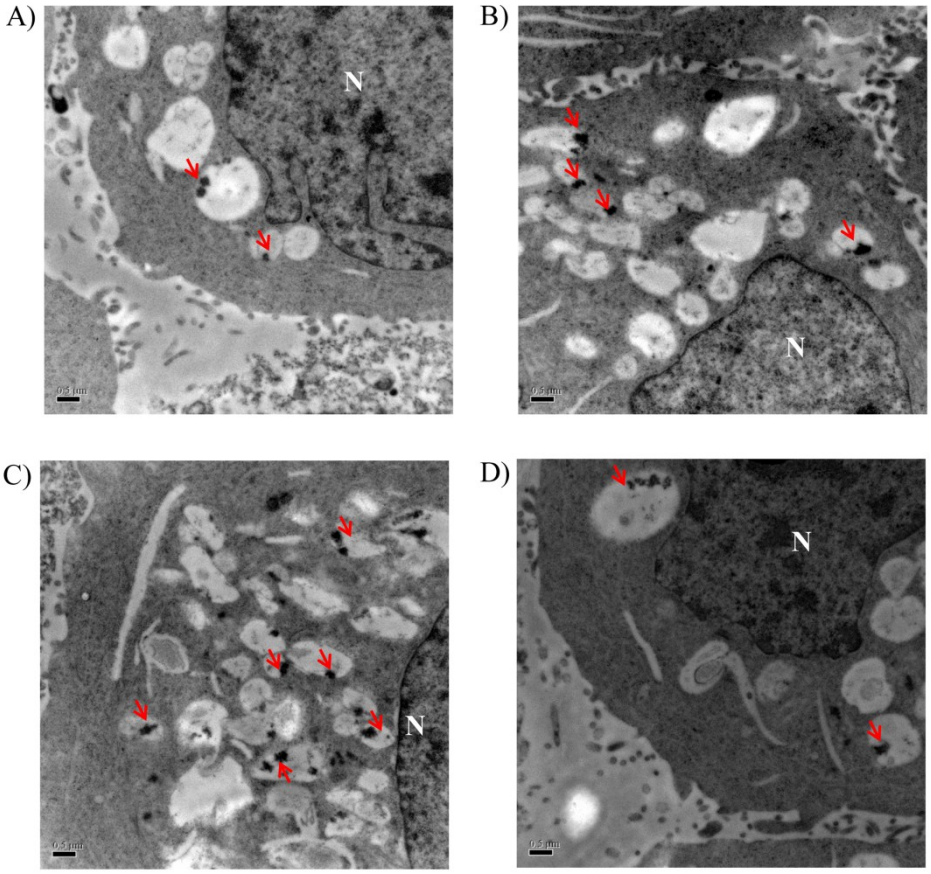

Figure S4. Magnified TEM images of HepG2 cells treated with SeNPs (A and B) or SeNPs@Cur (C and D) (N: nucleus, red arrows: nanoparticles in endocytic vesicles, scale bar indicate 0.5 μm).

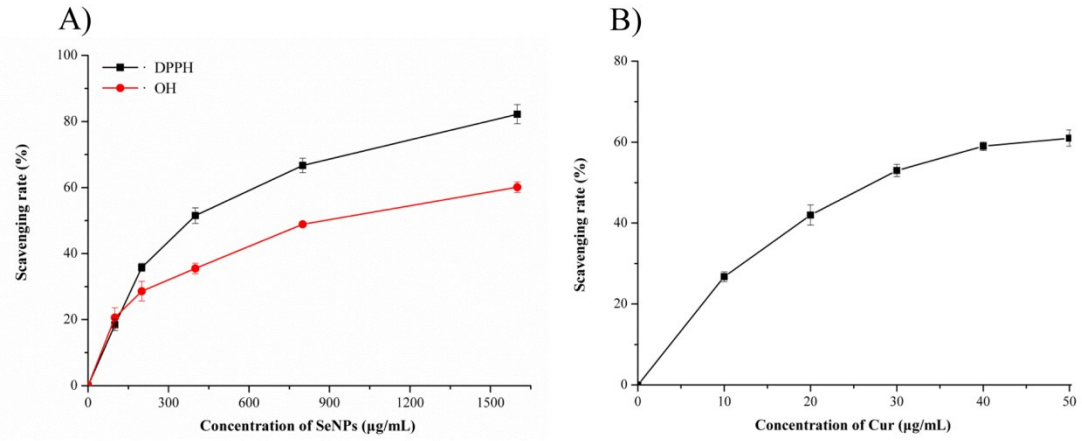

Figure S5. Free radical scavenging activities of SeNPs (A) and Cur (B) under enlarged concentration ranges.

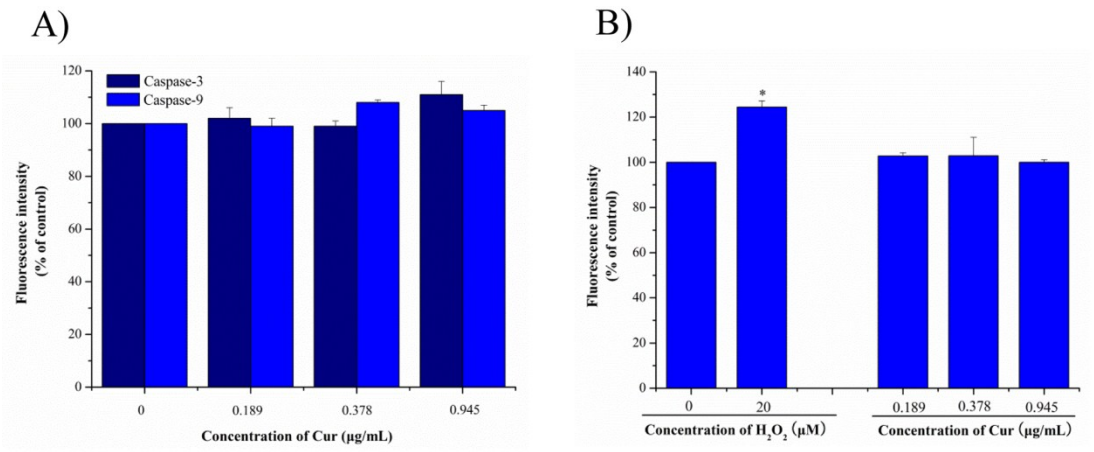

Figure S6. The activities of caspases (A) and levels of ROS (B) in HepG2 cells treated with Cur at different concentrations.