

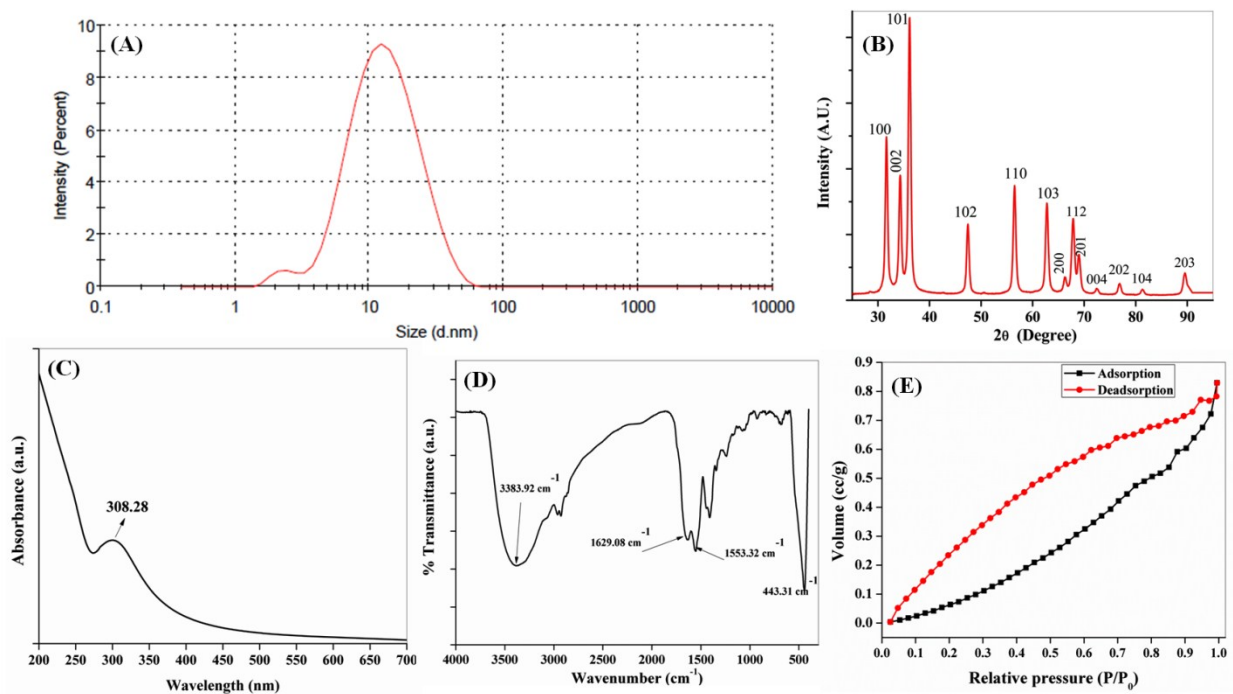
## Supplementary File

### **Biomolecule assisted one-pot synthesis of zinc oxide nanoparticles and its bioconjugate with curcumin for potential multifaceted therapeutic application**

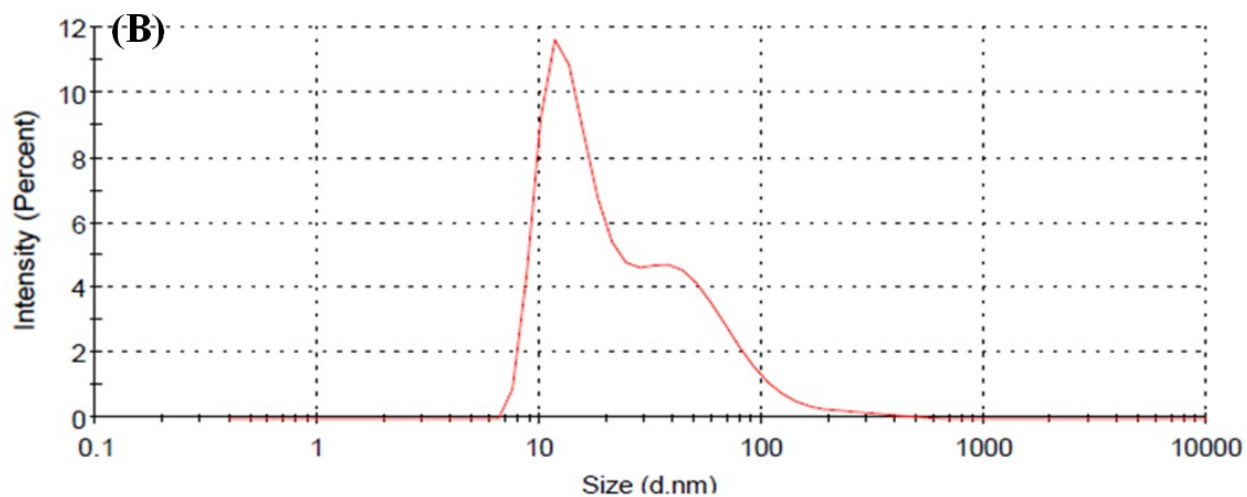
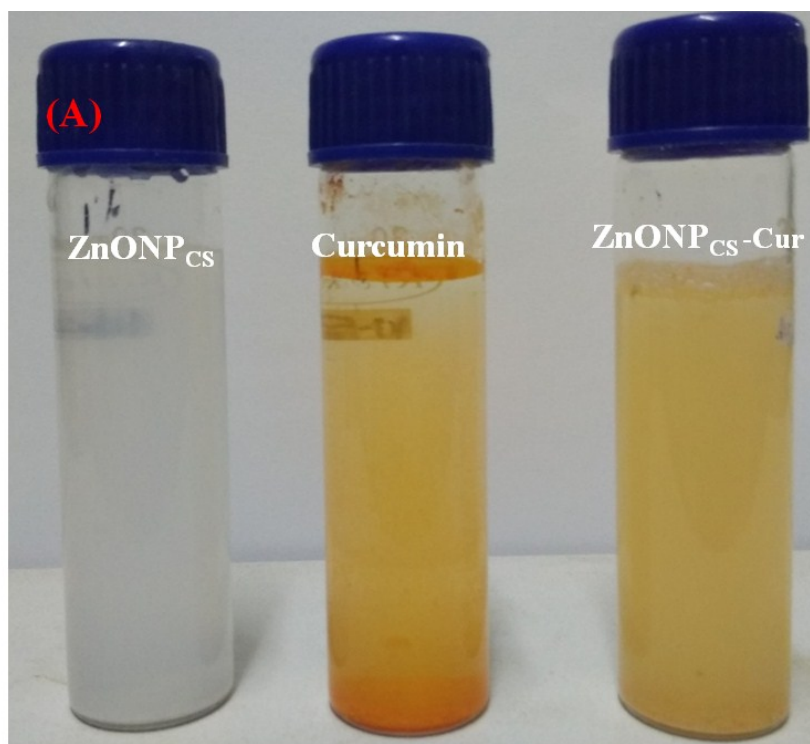
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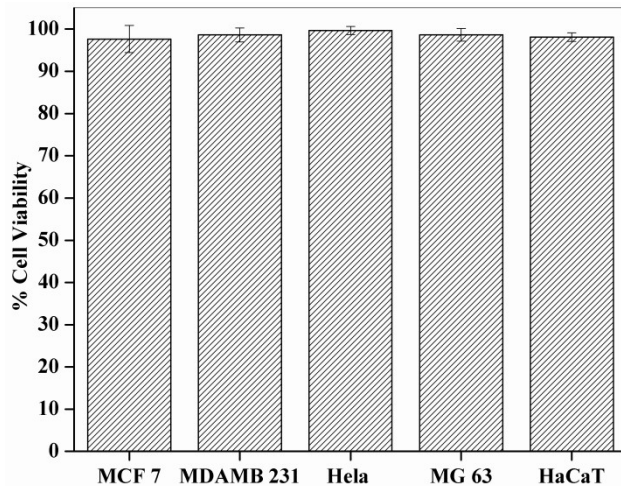
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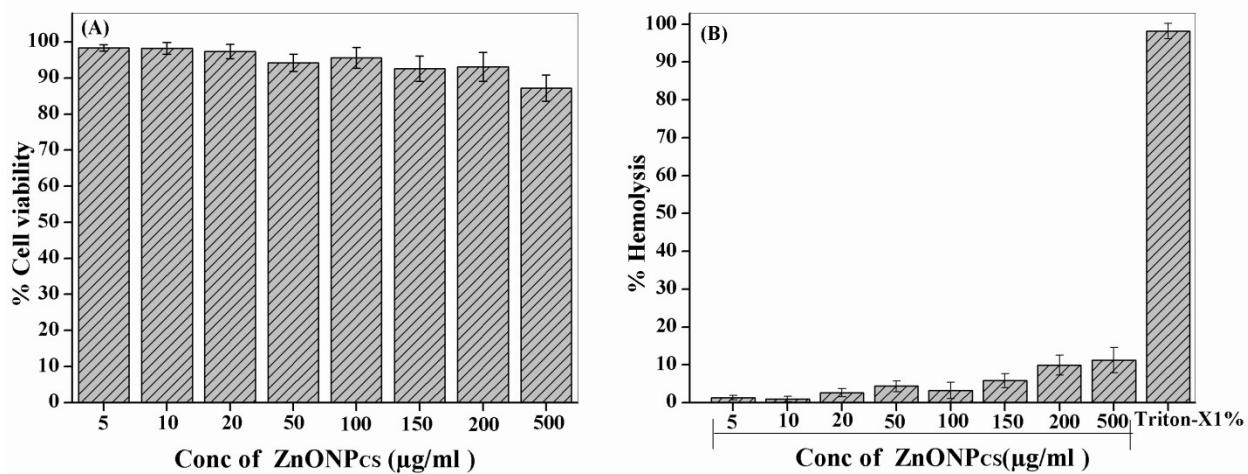
**Figure S1.** TEM, (A) Particle size distribution, (B) XRD, (C) UV-Vis adsorption spectra, (D) FTIR spectra and (E) BET analysis of casein capped ZnO nanoparticle (ZnONP<sub>CS</sub>).



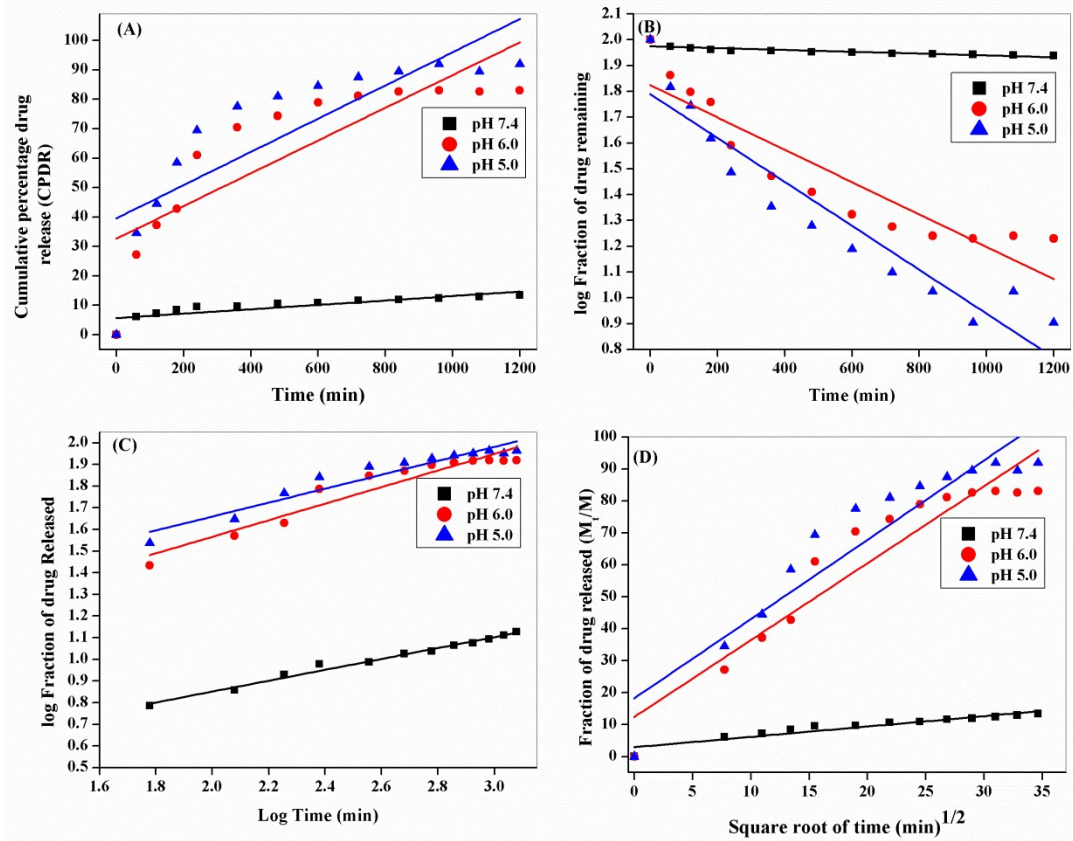
**Figure S2.** (A) Photographic image of free curcumin, ZnONP<sub>CS</sub>, and ZnONP<sub>CS</sub>-Cur captured after 24 h. (B) DLS analysis of ZnONP<sub>CS</sub>-Cur



**Figure S3.** Evaluation of Antiproliferative activity of native casein in various cancerous cells and Normal HaCaT cells.



**Figure S4.** (A) Cytocompatibility and (B) hemocompatibility assay of ZnONP<sub>CS</sub>.



**Figure S5.** (A) Zero-order kinetics, (B) First Order kinetics, (C) Korsmeyer–Peppas models kinetics, and (D) Higuchi kinetics model for the release of curcumin from ZnONP<sub>CS</sub>-Cur at various pH.

**Table S1.** The drug (curcumin) release kinetics of the NS<sub>CS</sub>-Cur nanoformulation

| Model                   | Drug release pH | R <sup>2</sup> | SST      |
|-------------------------|-----------------|----------------|----------|
| Zero order              | 7.4             | 0.4896         | 0.0095   |
|                         | 6.0             | 0.8435         | 0.0119   |
|                         | 5.0             | 0.8681         | 0.0167   |
| First Order             | 7.4             | 0.5110         | 0.0210   |
|                         | 6.0             | 0.9295         | 0.0196   |
|                         | 5.0             | 0.9697         | 0.0319   |
| Higuchi model           | 7.4             | 0.7288         | 0.491    |
|                         | 6.0             | 0.9765         | 0.361    |
|                         | 5.0             | 0.9859         | 0.0945   |
| Korsmeyer–Peppas models | 7.4             | 0.9724         | 0.92E-05 |
|                         | 6.0             | 0.9854         | 3.05E-05 |
|                         | 5.0             | 0.9939         | 2.16E-05 |