Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

ZnO–curcumin nanocomposite embedded hybrid collagen scaffolds for effective scar-less skin regeneration in acute burn injury

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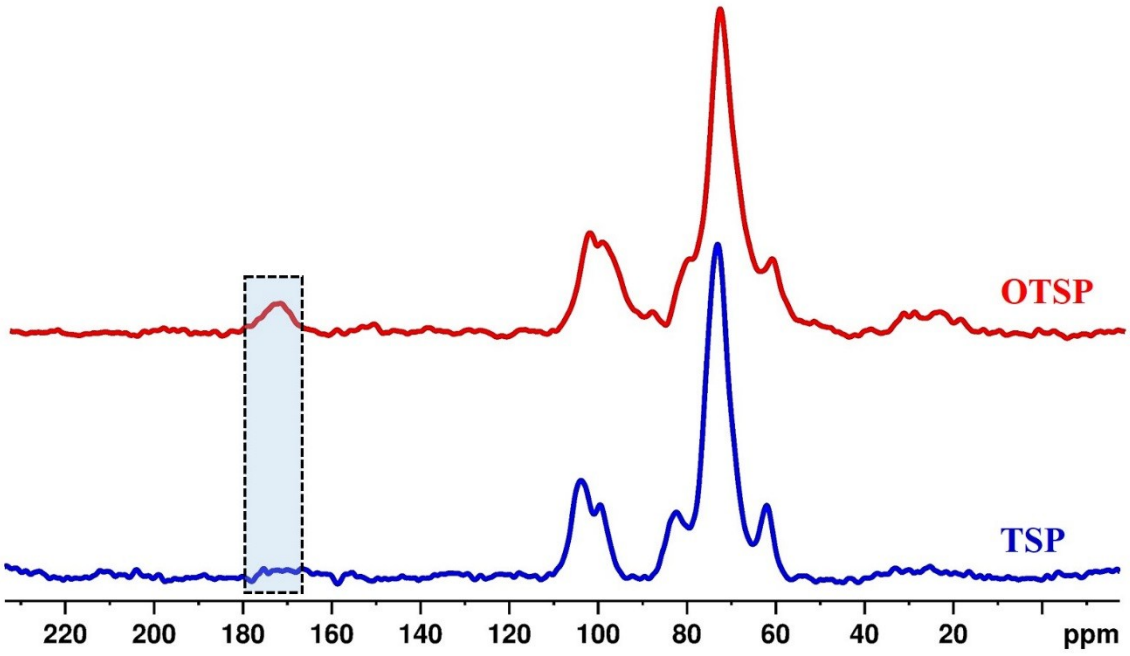

Fig. S1 ^{13}C solid state NMR spectra of the TSP and OTSP.

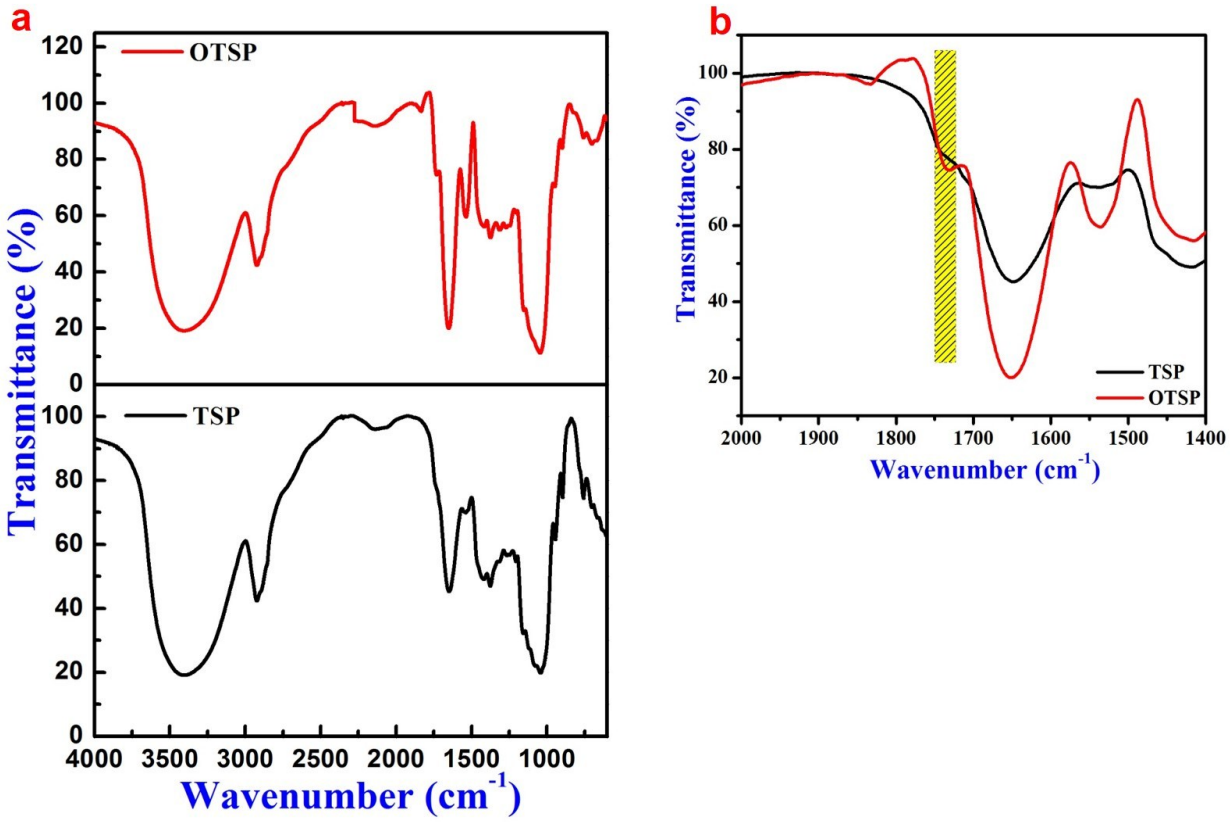

Fig. S2 (a) FT-IR spectra of TSP and OTSP; (b) Magnified FT-IR spectra in the range of 2000 to 1400 cm^{-1} showing the peak at 1730 cm^{-1} clearly.

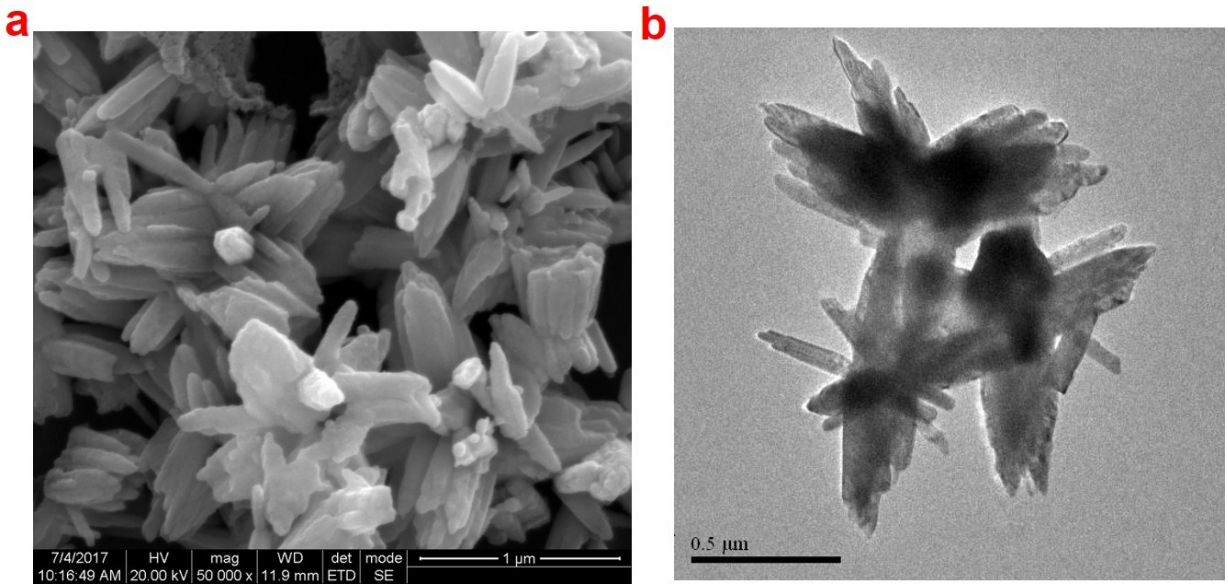

Fig. S3 (a) HRSEM and (b) TEM images of the synthesized ZnO nanostructures at lower magnification.

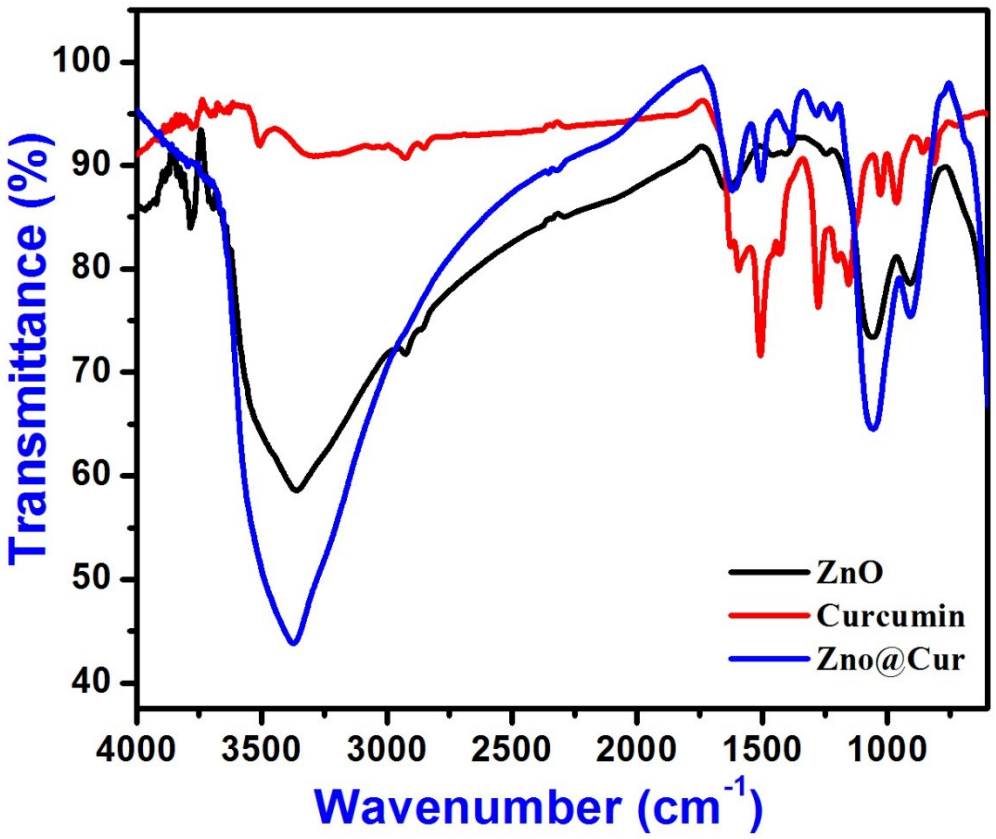

Fig. S4 FT-IR spectra of the ZnO nanoparticles, curcumin and ZnO@Cur nanocomposite.

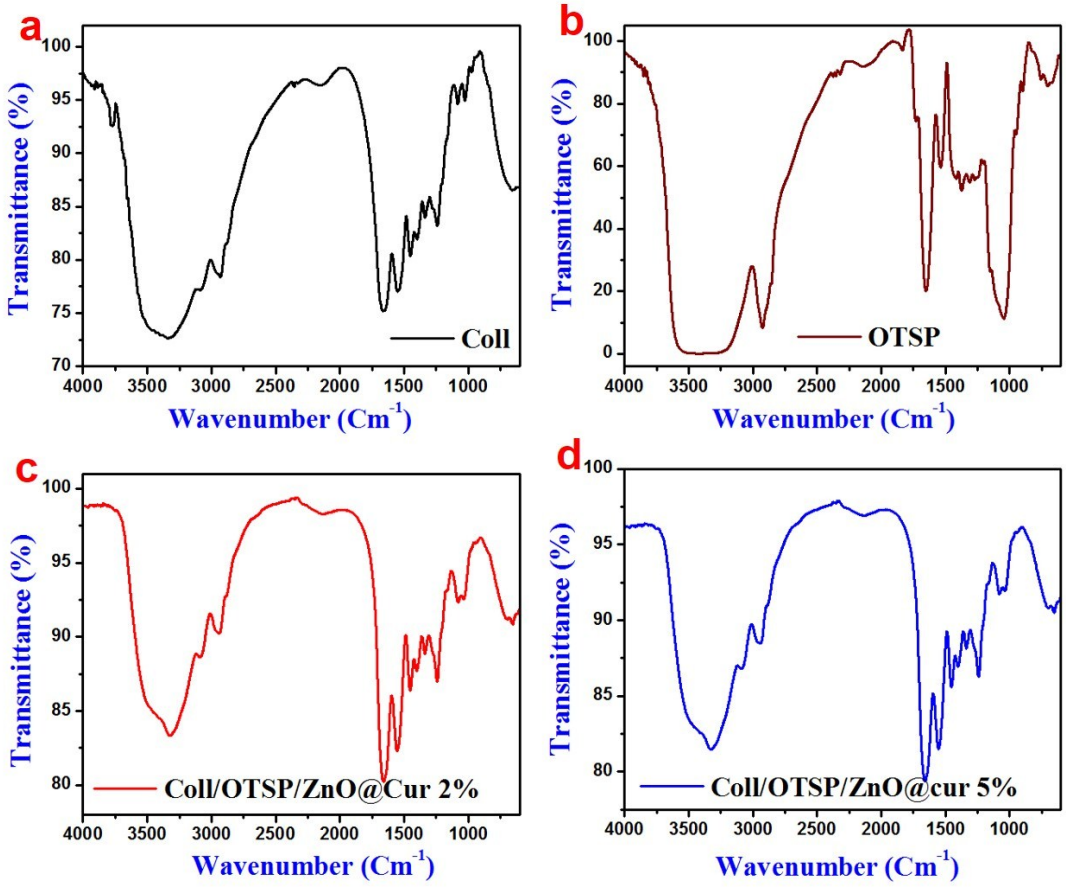

Fig. S5 FT-IR spectra of (a) collagen, (b) OTSP, (c) Coll/OTSP/ZnO@Cur 2% and (d) Coll/OTSP/ZnO@Cur 5% scaffolds.

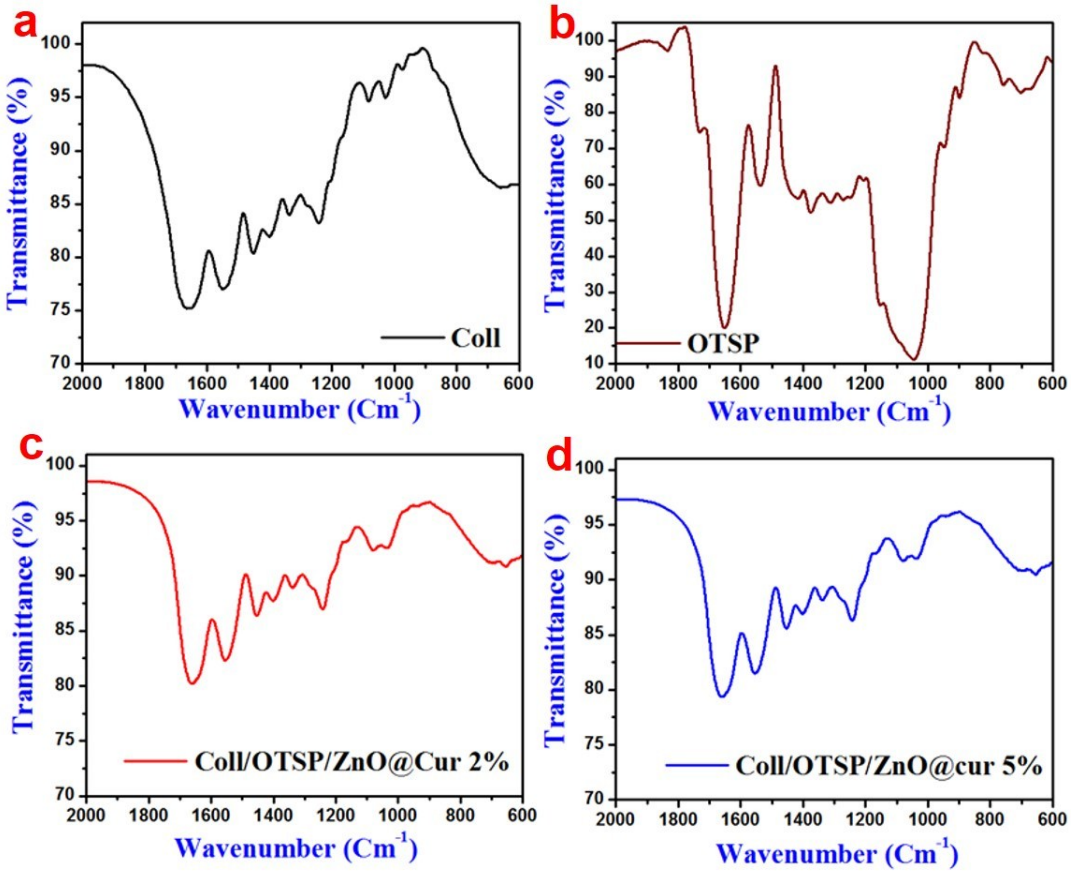

Fig. S6 Magnified FT-IR spectra of (a) collagen, (b) OTSP, (c) Coll/OTSP/ZnO@Cur 2% and (d) Coll/OTSP/ZnO@Cur 5% scaffolds.

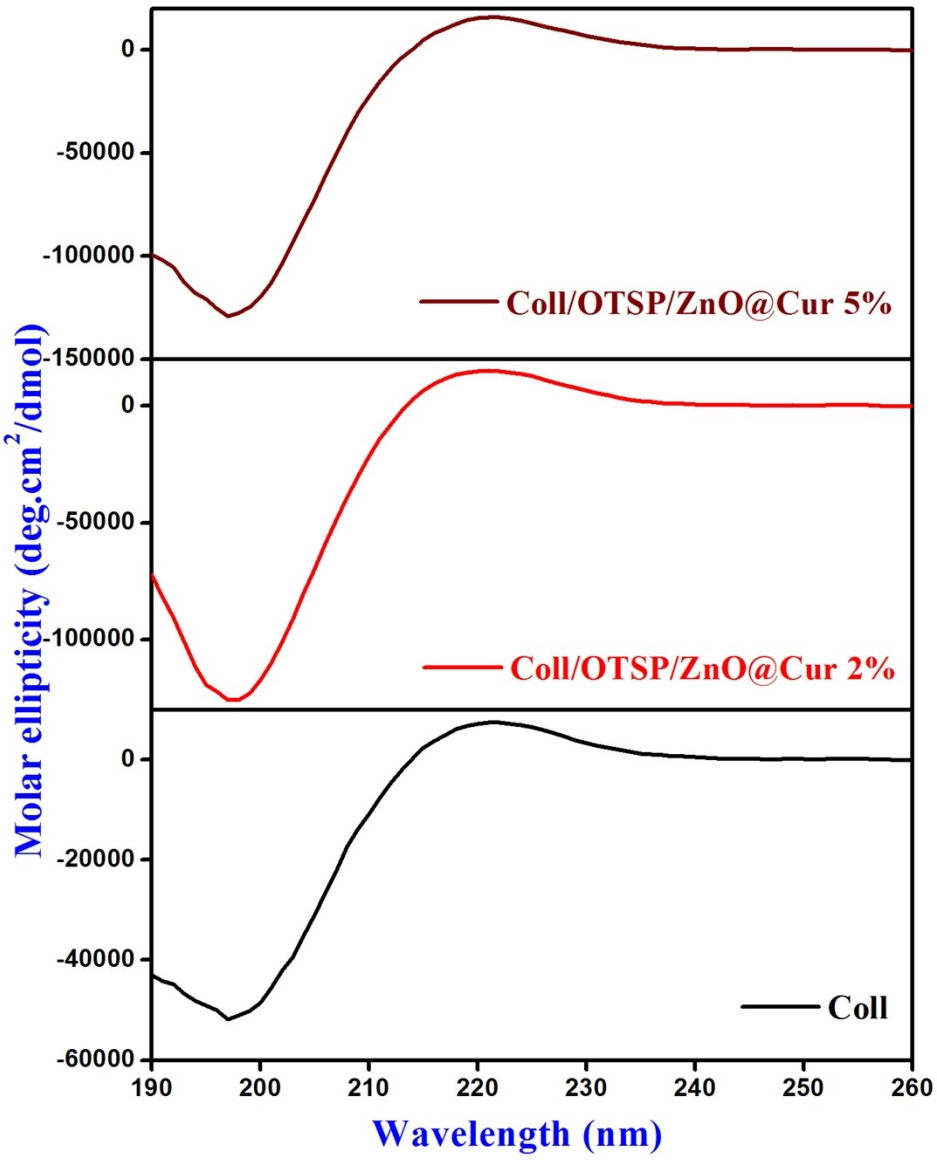

Fig. S7 CD spectra of the collagen, Coll/OTSP/ZnO@Cur 2% and Coll/OTSP/ZnO@Cur 5% solution.

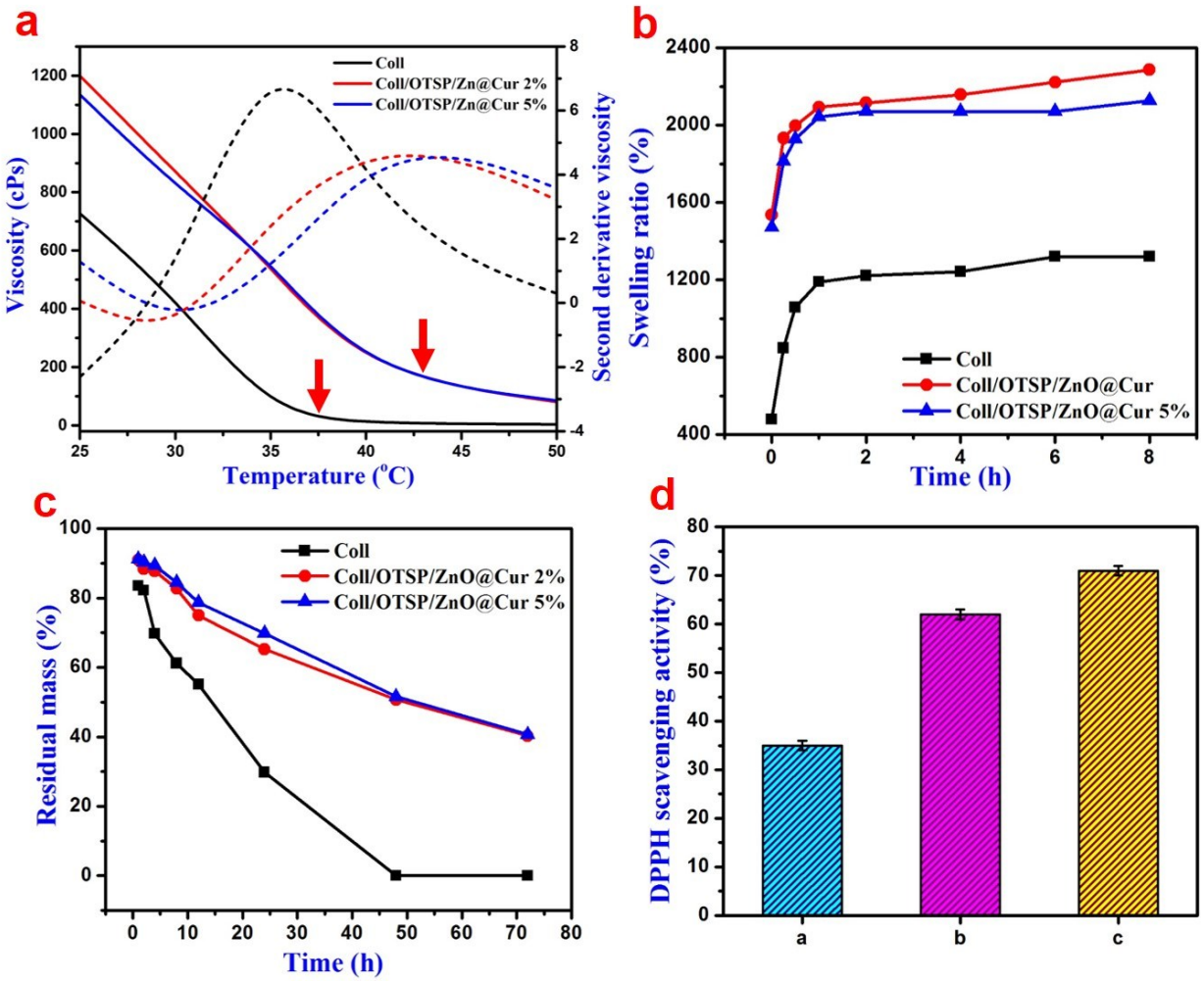

Fig. S8 (a) Viscosity, (b) swelling and (c) enzyme stability of the collagen, Coll/OTSP/ZnO@Cur 2% and Coll/OTSP/ZnO@Cur 5% scaffolds; Dotted lines in image (a) correspond to second derivative of change in viscosity with respect to temperature; (d) Anti-oxidant activity of the scaffolds; "a" represents collagen, "b" represents Coll/OTSP/ZnO@Cur 2% and "c" for Coll/OTSP/ZnO@Cur 5% scaffold in the image.

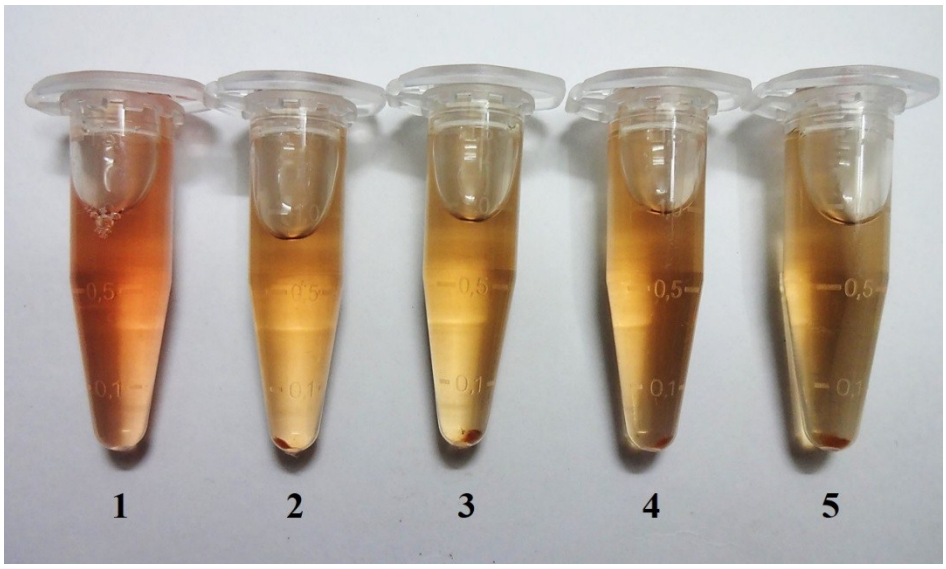

Fig. S9 Hemolytic activity of the scaffolds, where 1-2 represent 50 µl of RBC sample mixed with 950 µl water and 950 µl PBS, respectively; 3-5 represent 50 µl of RBC sample mixed with 950 µl PBS along with 5 mg of collagen, Coll/OTSP/ZnO@Cur 2% and Coll/OTSP/ZnO@Cur 5% scaffolds, respecctively.

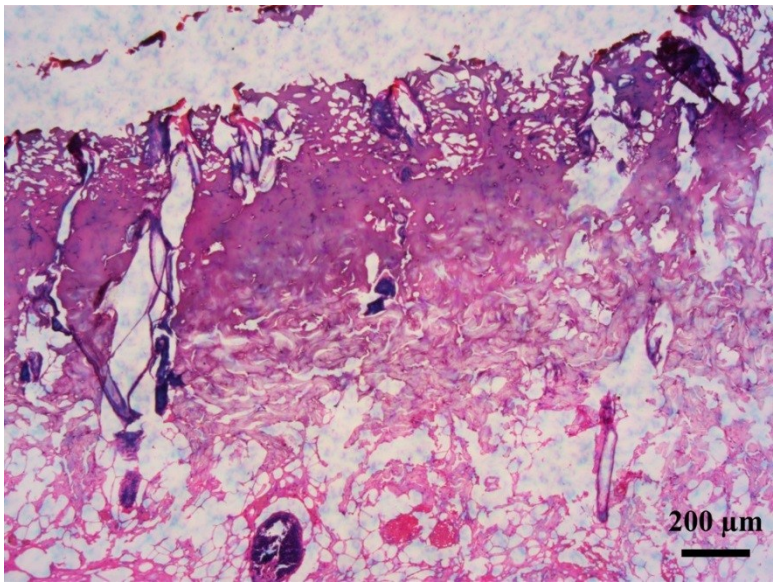

Fig. S10 H&E staining of the eschar tissue collected after burn wound creation.

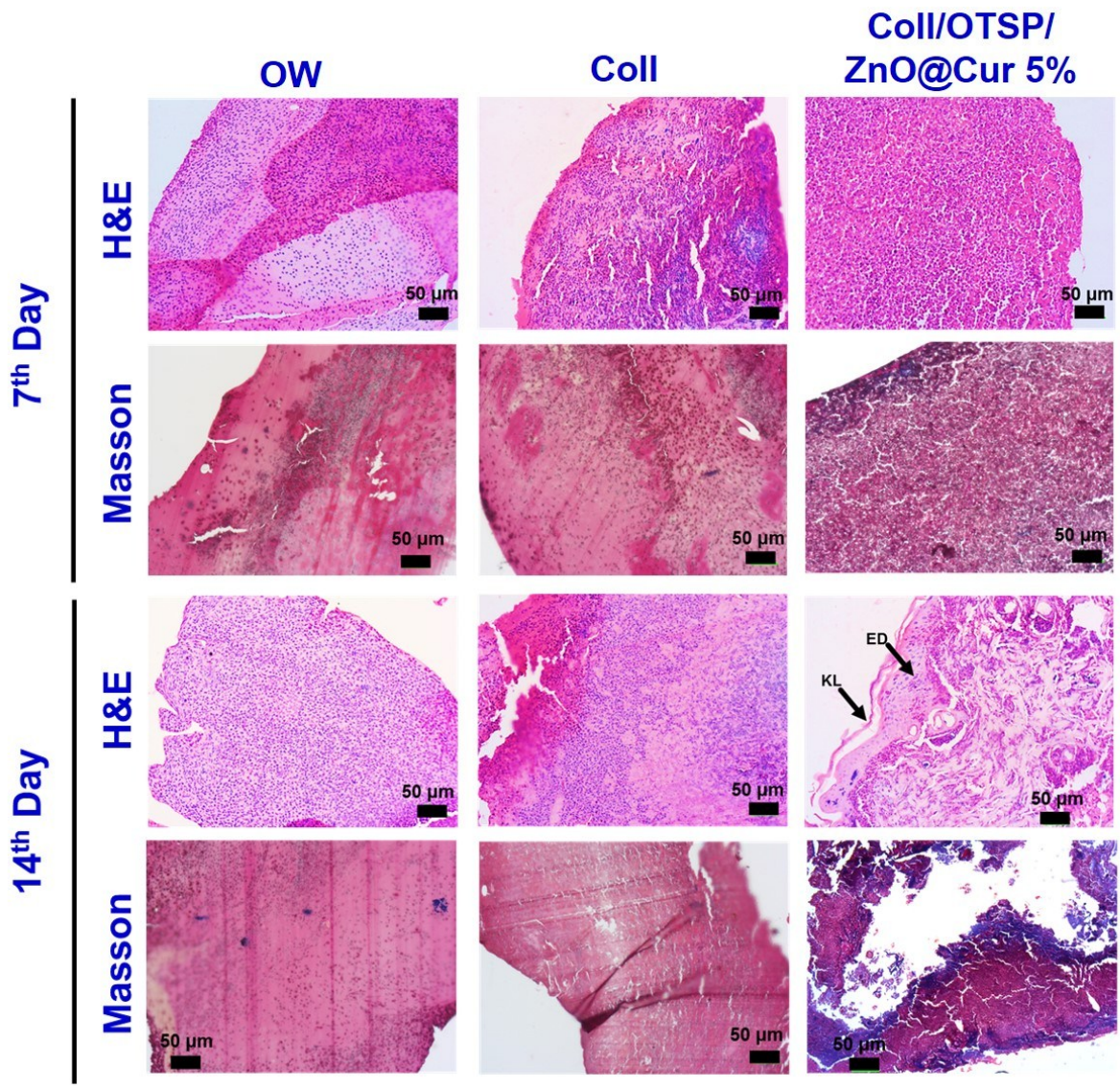

Fig. S11 H&E and Masson's trichrome staining of the granulation tissue collected on 7th and 14th day of treatment from all the animal groups namely open wound, native collagen and hybrid collagen treated groups, respectively. KL represents keratinized layer and ED represents epidermal layer in the H&E staining of the 14th day.

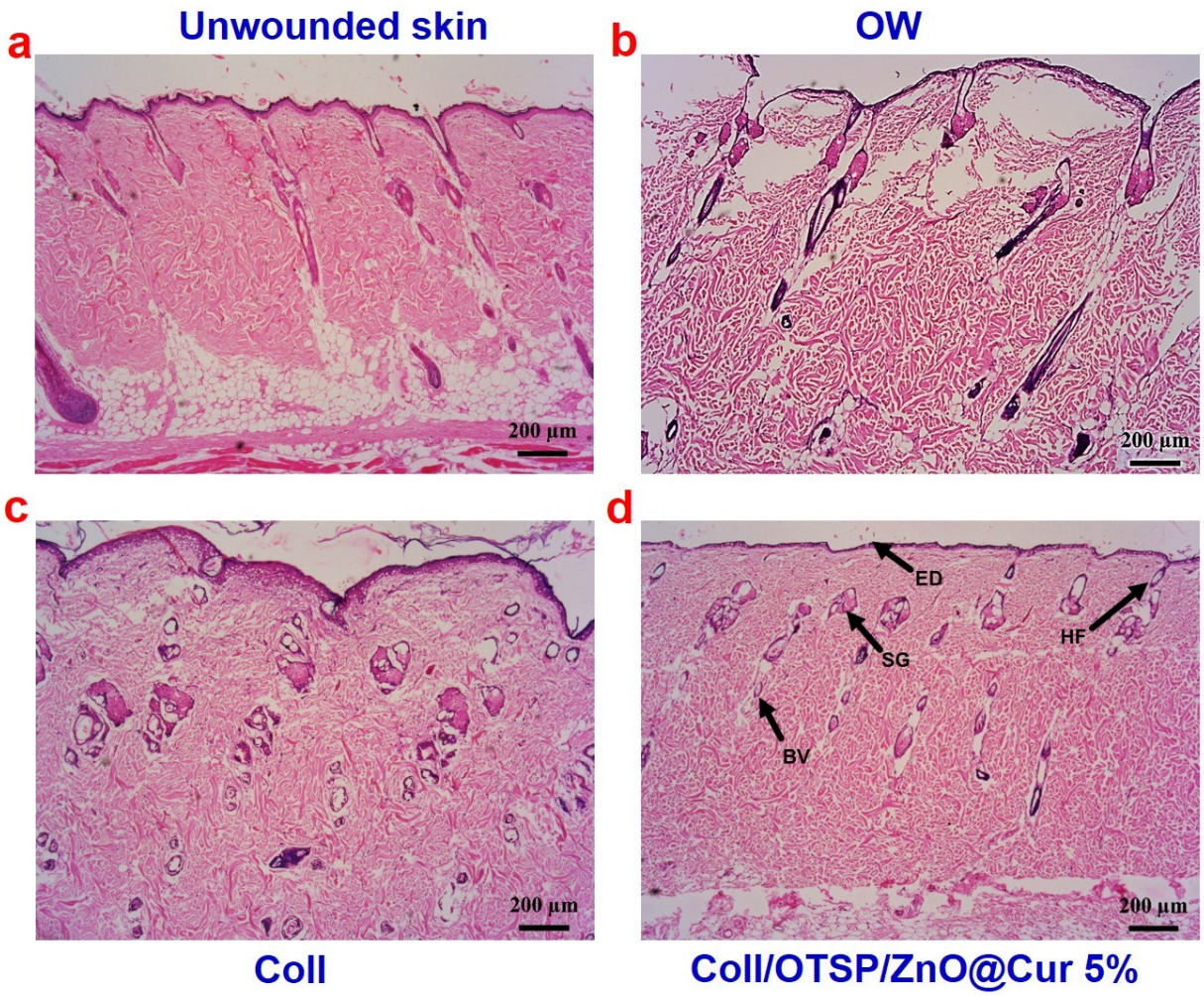

Fig. S12 Low magnification H&E staining images of (a) unwounded skin, regenerated skin from (b) open wound (OW) group animals, (c) native collagen scaffold (Coll) treated and (d) hybrid collagen scaffold treated animal groups after 21 days of healing followed by 30 days of maturation.

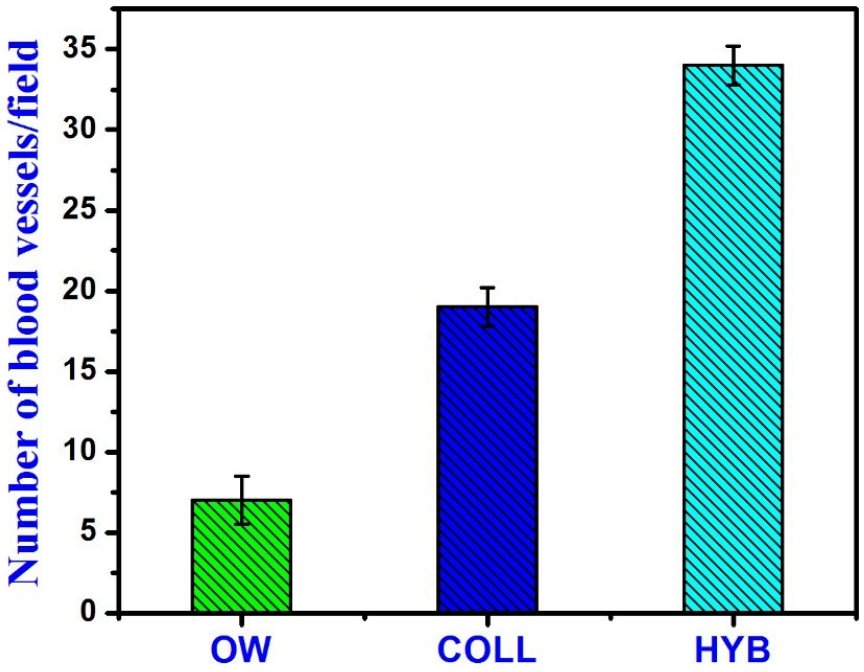

Fig. S13 Number of blood vessels calculated in specific field. (OW- open wound, Coll- Native collagen scaffold treated, HYB- Coll/OTSP/ZnO@Cur 5% scaffold treated)