Supplementary Information

S1 Synthesis of ZnO nanoparticles

ZnO nanoparticles (nZnO) were synthesized by previously described co-precipitation method.[33] Briefly zinc acetate dehydrate was dissolved in milli Q water and after obtaining a clear solution, the pH of solution was adjusted at 10 by drop wise addition of 1 M NaOH. The white precipitation was collected after a day by centrifuging the samples at 3000 rpm, washing several times with water and ethanol and drying in a hot air oven at slightly warm condition. The nanoparticles were further characterized by transmission electron microscope (TEM). For this, particles were sonicated in an ultrasonic bath and a few drops of suspension were allowed to evaporate on a copper grid at room temperature, examined under transmission electron microscope (TEM) and, electron diffraction (ED) and energy dispersive spectroscopy (EDS) were also recorded.

TEM micrographs (Figure S1A) exhibited particles in the range of 80-200 nm. Figure S1B and S1C exhibited electron diffraction pattern and EDS spectra of nZnO powders, where peaks of Zn and O were observed. The peaks of C were observed because of the carbon TEM grid.

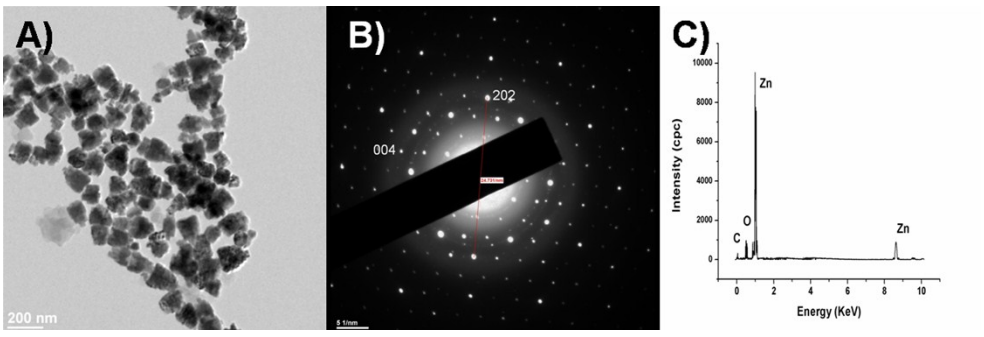

Figure S1. Characterization of synthesized zinc oxide nanoparticles (nZnO) powders. (a) TEM image, (b) Electron diffration and (c) EDS spectra

S2 Viscosity of electrospun solution:

The viscosity was measured for the precursor polymer solution using a rheometer with cone plate configuration. The rheological behavior of solutions was measured in the shear rate between 1 and 200 (1/S) at room temperature and 1 atm pressure.

Figure S2 shows the viscosity with shear rate. A significant decrease in viscosity was observed with the composite polymer solutions in comparison to pure gelatin solution.

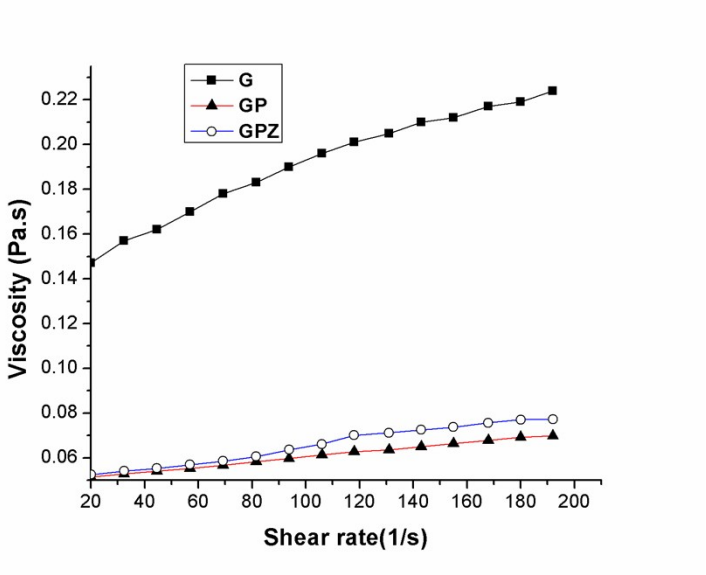

Figure S2 Change in viscosity with shear rate of different solutions

S3 Swelling and Degradation study: Now a day there is more focus on development of moisture retentive dressings as moist environment around a wound provide better wound healing by allowing migration and proliferation of cells. To check scaffold's capability to absorb water, scaffolds were weighed, and immersed in PBS at 37°C. At different time points, scaffolds were taken out from PBS, excess water was removed with blotting paper, and weighed again to measure water uptake. From the following equation, the swelling ratio was calculated.

$$Swelling\ ratio = \frac{Ww - Wd}{Wd} X\ 100$$

where Ww = weight of wet scaffold and Wd = weight of dried scaffold.

Scaffolds exhibited substantial swelling in initial 30 min only, after that equilibrium was achieved (Figure 4C). Higher swelling ratio was observed with composite scaffolds GP and GPZ in comparison to scaffold G which could be understood by two facts- firstly PMVE/MA incorporation to scaffolds increased the hydrophilicity and secondly due to smaller fiber diameter composite scaffolds had larger surface area to volume ratio for absorption of fluid. The higher swelling capability of nanofibrous meshes aids in wound healing not only by absorbing the exudates at faster rate but also by maintaining moisture and high gas permeation around the wound.[45]

To measure scaffold's degradation, scaffolds were weighed, kept in PBS and incubated at 37°C in rotating shaker at 125 rpm. After every 5 days, scaffolds were taken out, washed with water, freeze dried and weighed again. From the following equation, the residual mass was calculated.

$$\%Residual\ Mass = 100 - \frac{Mi - Mf}{Mi} * 100$$

where M*f* is the final mass at each time point and M*i* is the initial mass.

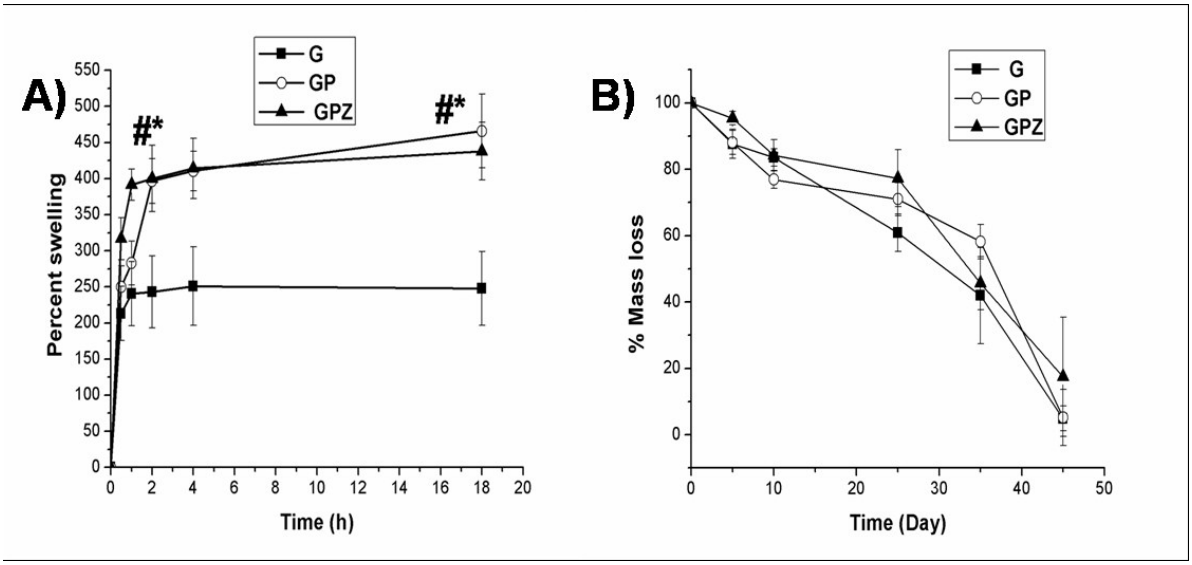

Figure S3 A) Swelling study of scaffold G, GP, GPZ (* p<0.05 relative to G and GP-1, # p<0.05 relative to G and GPZ), B) Degradation profile of different scaffolds in PBS at 37°C

A progressive decrease in weight loss was seen in all scaffolds with time (Figure 4D). It was observed that scaffold's degradation was slowly in initial 20 days losing around 40% of mass. After that sharp decrease was observed and scaffolds were almost completely degraded in 40 days.

S4. Protein adsorption

To assess the protein adsorption on scaffold surface, scaffolds were pre-washed with PBS, air dried and incubated with 300 µl of FBS for 2 hr at 37 °C. After incubation, scaffolds were rinsed gently with PBS to remove unattached proteins. 1 ml solution of sodium dodecyl sulphate (SDS, 1 wt %) was added and tissue culture plate (TCP) was kept on shaker for 60 min to remove adsorbed proteins from scaffold surface to SDS solution. The amount of proteins adsorbed (µg/cm^2) on the surface was calculated from the concentration of proteins in the SDS solution with protein analysis kit (Micro BCA Protein Assay Kit, Pierce Biotechnology, IL,

USA). The calibration curve for protein concentration was obtained with bovine serum albumin standard solutions provided with the test kit.

Supplementary Figure S2 shows the amount of protein adsorbed on different scaffolds. The protein adsorption study on scaffold is important as the cell and material interaction starts with protein adsorption which further affects the cell adhesion and proliferation. The better protein adsorption was observed in composite scaffold as compared to G and GP scaffold which could be attributed to higher surface area to volume ratio of composite scaffolds.

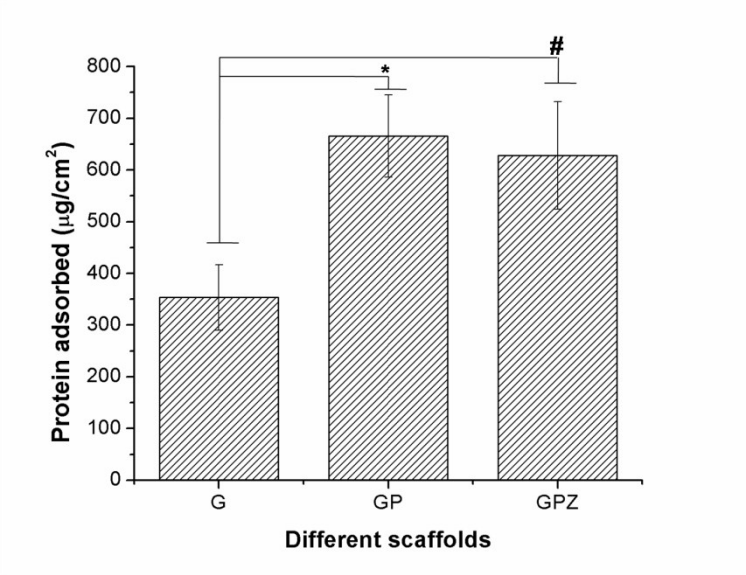

Figure S4 Amount of protein adsorbed on different scaffolds G, GP and GPZ