# CHAPTER V

# CONCLUSIONS

The technique of electrospinning was used to produce Gelatin/Hyaluronic acid blend fiber mats for medical applications. The factors of the electrospinning process investigated were solvent system, blend ratio of the solute, viscosity and conductivity of electrospinning solution. The Gelatin/Hyaluronic acid blend fibers with the average diameter of 100-120 nm were successfully produced using 40% Acetic acid solution as solvent, 20 kV applied voltage and the blend ratio of 40:1 Gelatin:Hyaluronic acid at room temperature. The fiber mats were then cross-linked with Glutaraldehyde vapour at 37°C at different time intervals of: 30 min, 1 hr, 2 hr, and 4 hr. The cross-linked mats showed an increase in strength with longer cross-linking time interval when subjected to tensile tests, observable by the change in percentage strain at break and the Yong's modulus. The functional group change from the cross-linking process was determined by using FTIR. The change in functional group found was the increase in amide linkages which enables the cross-linked fiber mats to have its water resistant ability. The cross-linking density were further evaluated by using swelling test in simulated body fluid (SBF) which showed an decrease in swelling percentage as the cross-linking time was increased. Thermal degradation profile comparing cross-linked and uncross-linked fiber mats showed similar thermal degradation temperature at approximately 300°C which proves that cross-linking process did not strengthen its resistivity to thermal degradation. The scanning electron microscopy (SEM) images showed changes in fiber morphology after cross-linking. The fiber mats appear to have smooth fibers with many joints at the intersections with adjacent fibers. When subjected to cytotoxicity testing with mouse fibroblast cells (L929), the MTT results indicated non-toxicity.