

Study the effect of silk-fibroin/nanochitosan/hyaluronic acid on adhesion, proliferation and osteoblast differentiation of bone using MC3T3-E1 cell line for tissue engineering

S. Gokila, T. Gomathi, K. Vijiyalakshmi and P. N. Sudha*

Biomaterials Research Lab, Department of Chemistry, D.K.M. College for Women, Vellore-632 001, Tamilnadu, India

E-mail: drparsu8@gmail.com

Manuscript received online 27 August 2018, accepted 10 October 2018

Nanochitosan/silk-fibroin/hyaluronic acid (NCS/SF/HA) of ternary blend was prepared and then nanochitosan was chemically crosslinked were geared up by the simple ionic cross linking method using TPP to get better bioavailability. Characterizations of the ternary blends were investigated by thermo gravimetric analysis (TGA) and differential scanning calorimetry (DSC), *in vitro* studies were carried out. *In vitro* cell culture study using MC3T3-E1 cells has shown an enhanced cell attachment, proliferation, differentiation, scaffold porosity and hydrophilicity, were further achieved by the incorporation of the ternary scaffolds NCS/SF/HA. The assay studied in the cell line MC3T3-E1 include LDH. In the near future, it is most likely that the NCS/SF/HA/scaffold based systems would help to reconcile the clinical and commercial demands in tissue engineering.

Keywords: Silk fibroin, nanochitosan, hyaluronic acid, biomaterial, cell culture, *in vitro* studies.