

Flow chart depicting the process followed for fabrication of scaffold.



Fig. 1: (a) Groundnut shell powder, (b) NaOH treatment, (c) Delignified powder, (d) acid reflux, (e) acid refluxed powder, (f) bleached cellulose, (g) CNC, (h) fabricated and (i) freeze dried scaffold.

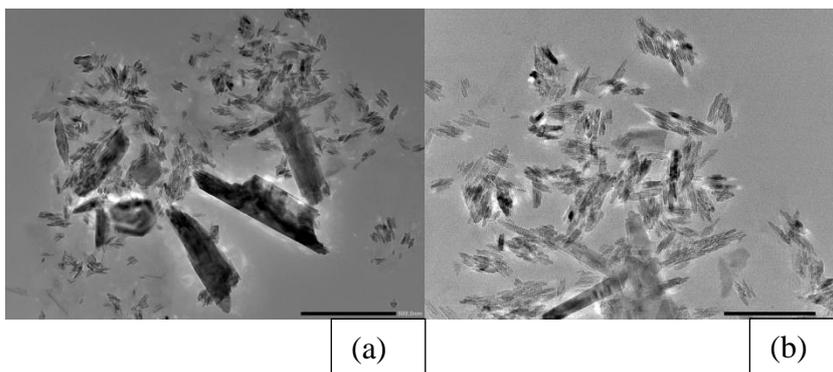


Fig. 2: TEM images of cellulose nanocrystals (CNC) (a) and (b) are TEM images of cellulose nanocrystals formed after acid hydrolysis of cellulose. (a) TEM images of CNC at 200nm and (b) TEM images of CNC at 500nm.

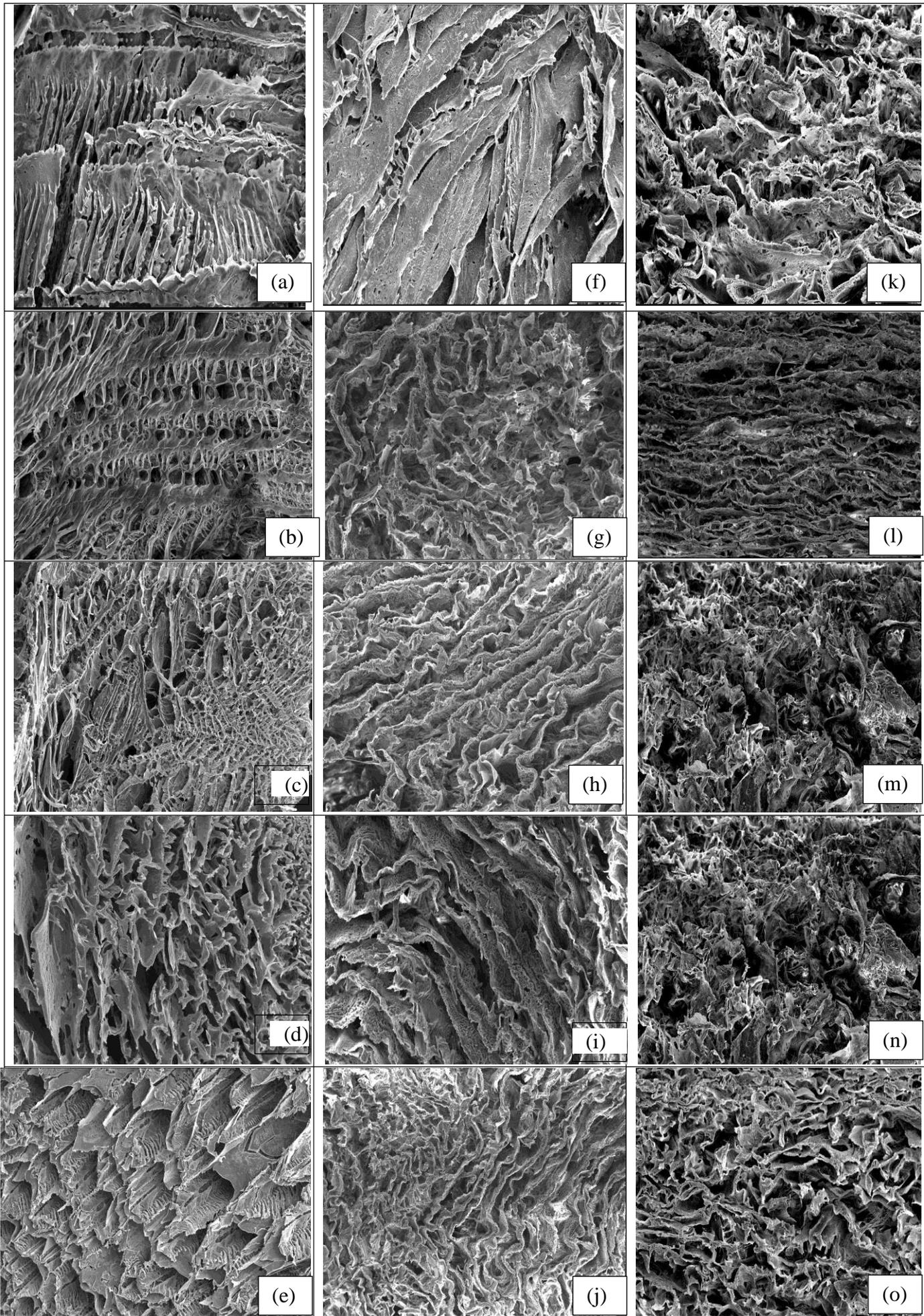
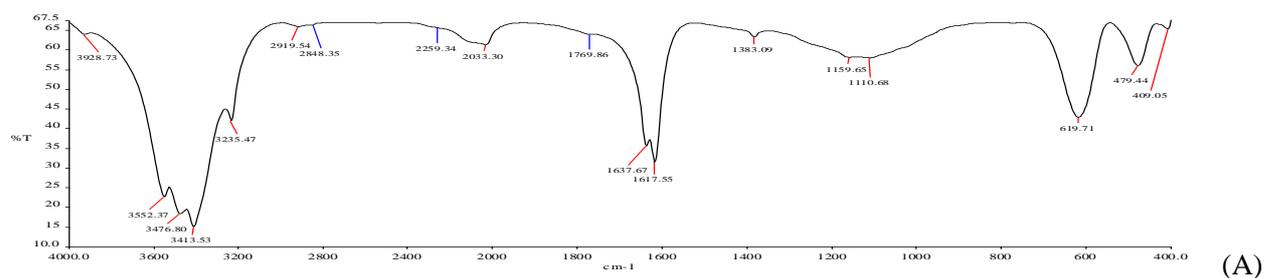
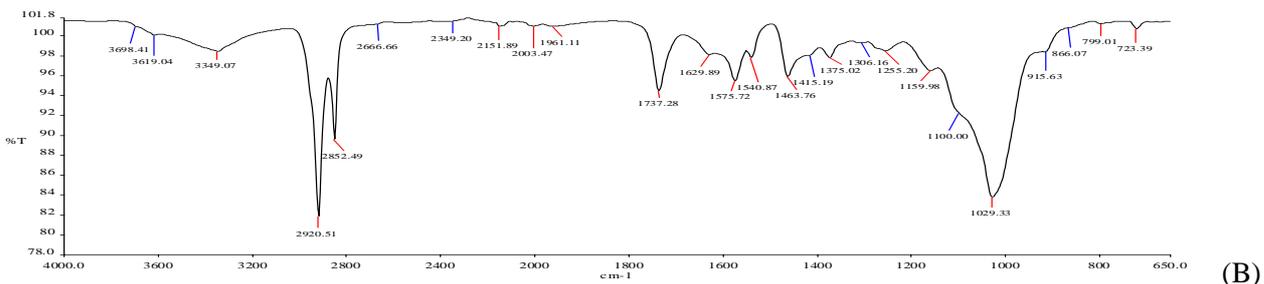


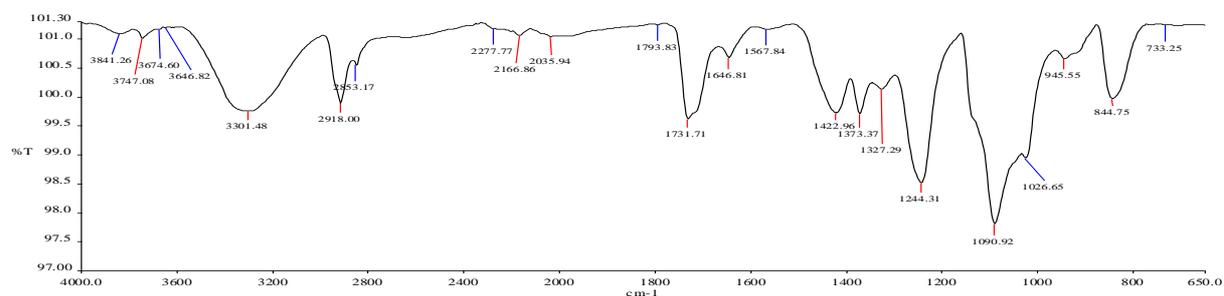
Fig. 3: FE-SEM micrographs of (a)-(e) PVA/CNC_0%; (f)-(j) PVA/CNC_5%; (k)-(o)PVA/CNC_10%



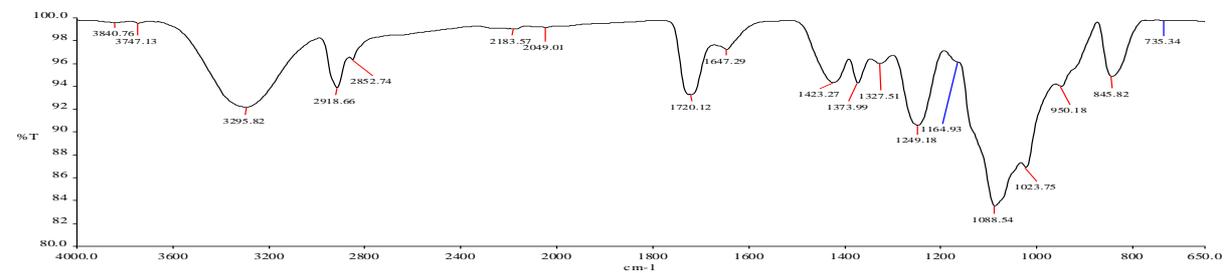
Cellulose



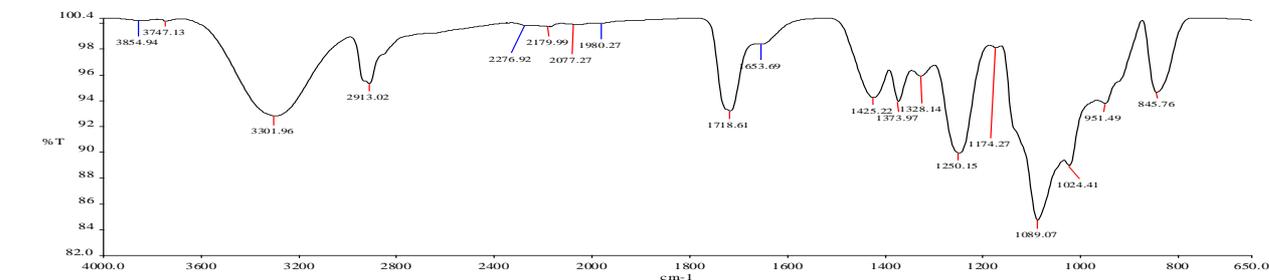
Cellulose Nanocrystals (CNC)



(C) PVA/CNC_0%

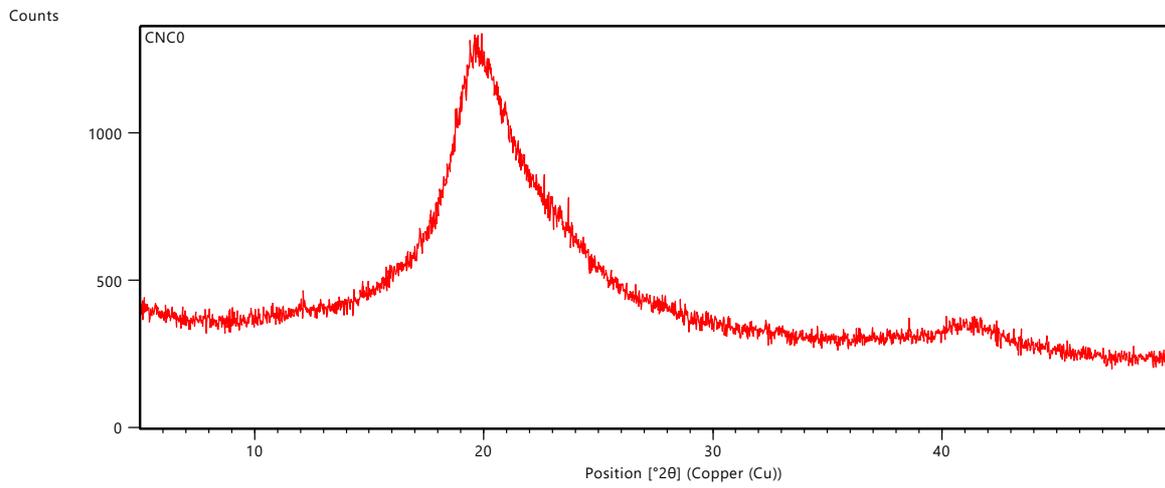


(D) PVA/CNC_5%

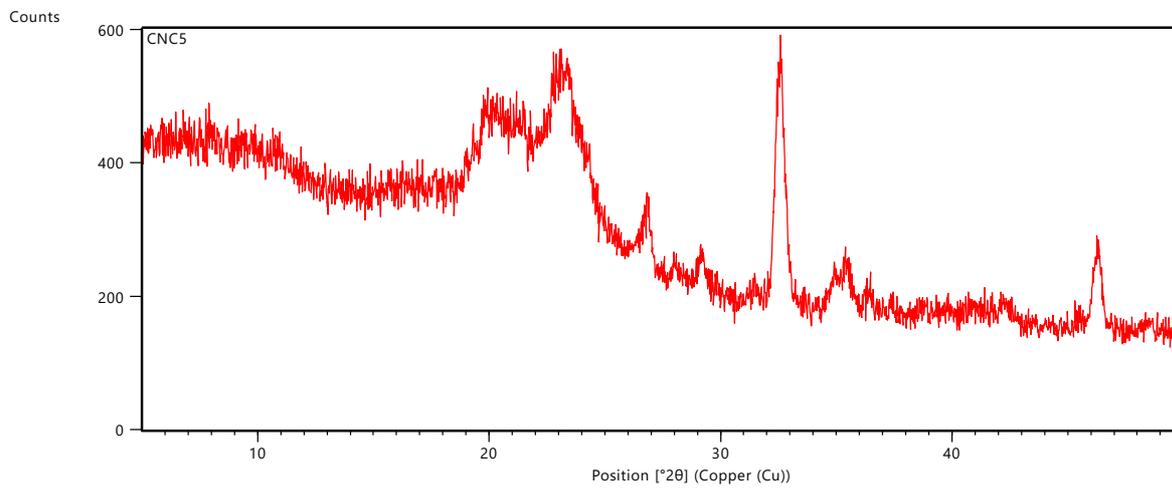


(E) PVA/CNC_10%

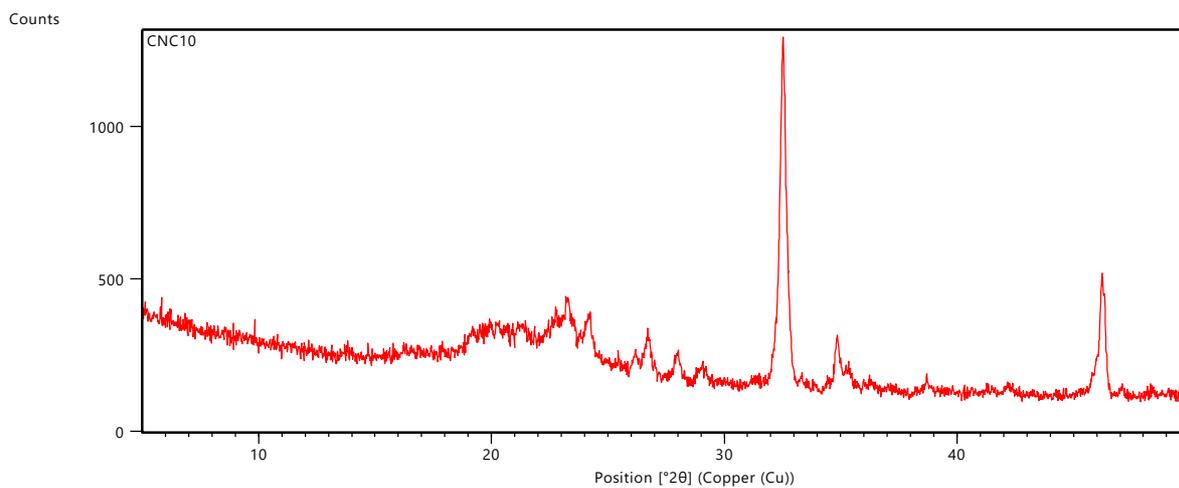
Fig. 4; FTIR spectra of (A) Cellulose; (B) Cellulose Nanocrystals (CNC); (C) PVA/CNC_0%; (D) PVA/CNC_5%; (E) PVA/CNC_10%



(A) PVA/CNC_0%



(B) PVA/CNC_5%



(C) PVA/CNC_10%

Fig. 5; XRD patterns of (A) PVA/CNC_0%; (B) PVA/CNC_5%; (C) PVA/CNC_10% scaffolds. All the scaffolds exhibit semi-crystalline nature.

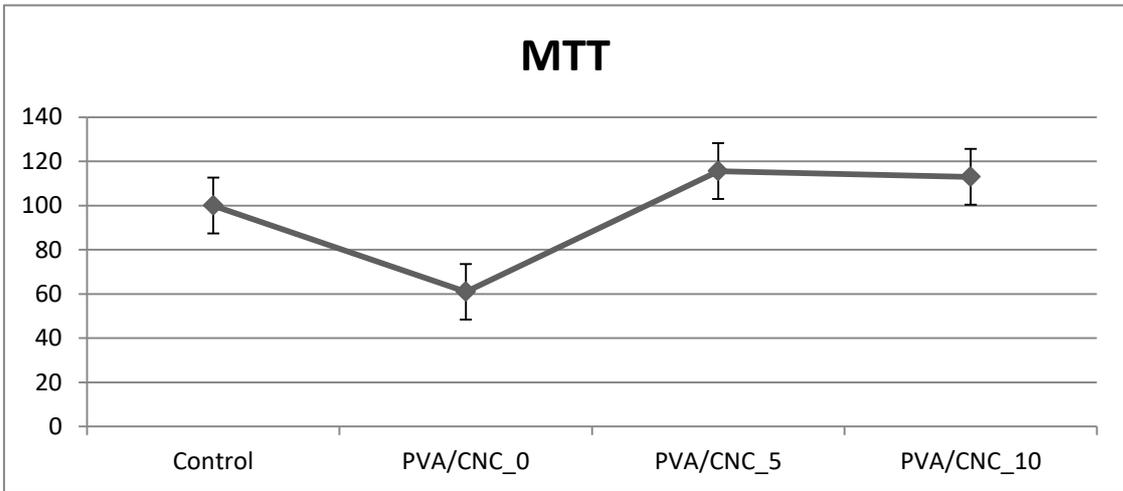
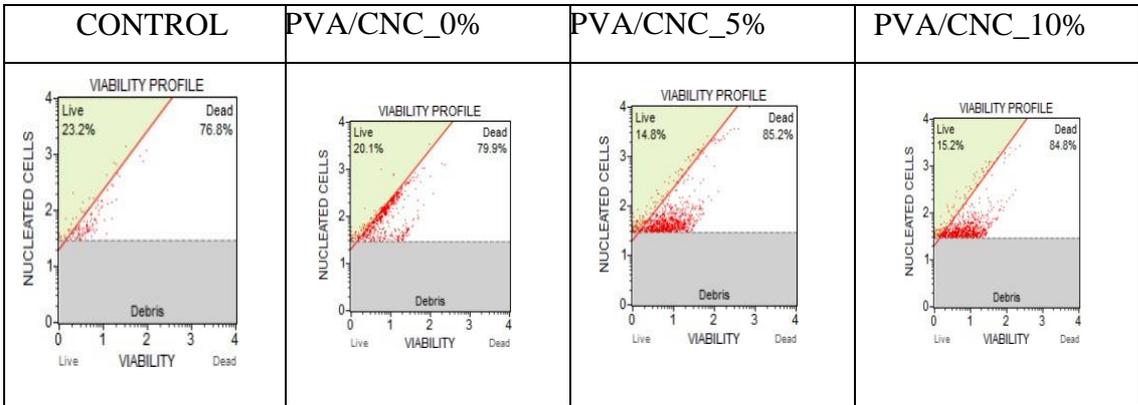
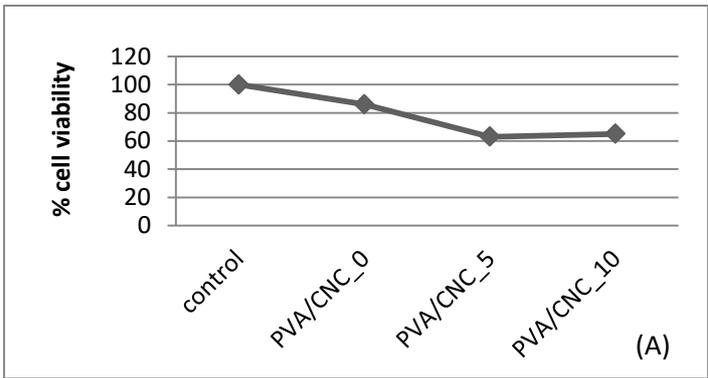


Fig. 6: Results of MTT performed control is taken to be 100% and relative percentage viability was measured. Treatments with PVA/CNC bioscaffold have shown to increase cell viability.



(B)

Fig. 7: Effect of scaffolds on the proliferation of murine mesenchymal stem cells(C3H10T1/2). After 24 hours of treatment, the cells were then subjected to a cell count and viability assay using a MUSE™ automated cell counter. Precise gating adjustments were pre-set to exclude debris, nucleated cells, and live cells from dead cells. (A) representative plot showing the live cell populations and dead cell populations on the left and right quadrants, respectively. Shows the cell viability results of control, PVA/CNC_0, PVA/CNC_5, PVA/CNC_10. PVA was clearly a cell-friendly material with greater than 70% cell viability. (B) Shows the cell analyser report with different scaffold compositions and control with no scaffold [20,23]

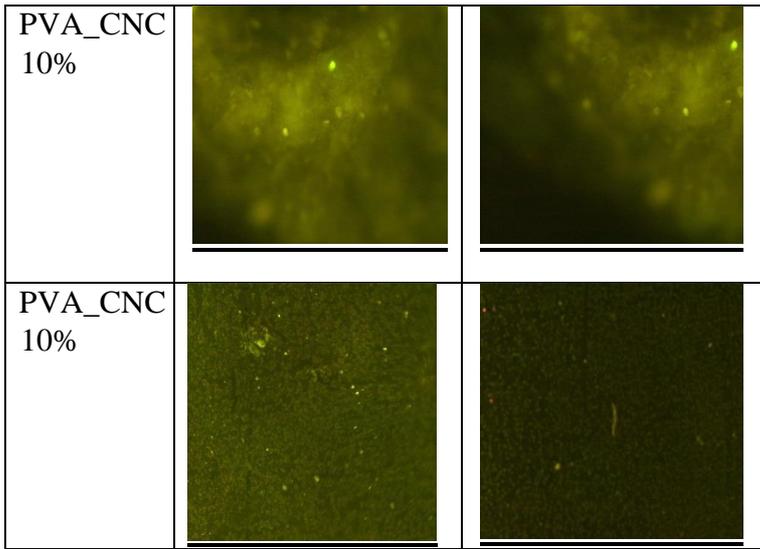


Fig. 8; DAPI stain nucleus in scaffold PVA/CNC_10%

