CHAPTER V
CONCLUSIONS

In the present contribution, solvent casting and salt particulate leaching technique, was used to fabricate bone scaffolding materials from aliphatic polyesters—polycaprolactone (PCL), poly(1,4-butylene succinate) extended with 1,6-diisocyanatohexane (PBSu-DCH), poly(lactic acid) (PLA), poly(3-hydroxybutyric acid) (PHB), and poly(3-hydroxybutyric acid-co-3-hydroxyvaleric acid) (PHBV) — at a 30:1 NaCl/polymer weight ratio. The pores created by this technique were uniformly distributed and interconnected with average pore diameters in the range of 400-500 μm and the average porosity was in the range of 93-95%. The water absorption of the scaffolds was quick in the early 24 hours and maintaining stable after a couple of days. The compressive modulus of the scaffolds was decrease in the order of PLA>PHBV ≈ PHB>PBSu-DCH>PCL. After enzymatic degradation study, lipase from *Pseudomonas sp.* has revealed its higher degradation activity of PCL and PHBV. The degradation rates of the scaffolds in lipase/PBS solution at 37°C can be rank as follows: PBSu-DCH>PCL>PHB>PHBV>PLA. The crystallinity of the degraded scaffolds wasn't decrease when compared to the before degraded scaffolds. This indicated that the degradation process occurred in the amorphous region. The cell-material interaction study indicated that human osteoblast cells (SaOS-2) seeded on the PCL and PBSu-DCH scaffolds appeared to attach and proliferate well. Additionally, ALP activity result signified that PCL and PBSu-DCH scaffolds also better promoted the differentiation of SaOS-2 than the others. These encouraging results support the potential applications of PCL, PBSu-DCH, PLA, PHB and PHBV scaffolds as an improved alternative to other polymer-base scaffolds for tissue engineering applications.