(OP 89) Dynamic Studies of Biomimetic Coated Polycaprolactone Nanofiber Meshes as Bone Extracellular Matrix Analogues

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This work aimed at studying the effects of dynamic culture conditions and biomimetic coating on bone cells grown on nanofiber meshes. In our previous work, biomimetic calcium phosphate coated polycaprolactone nanofibre meshes (BCP-NM) proved to be more efficient for supporting cell attachment and proliferation under static conditions, when compared to polycaprolactone nanofibre meshe (PCL-NM). However, no studies on the influence of bioreactors on the behaviour of cells cultivated on these materials were developed so far. In fact, *in vitro* cultivation of constructs using bioreactors which support efficient nutrition of cells has appeared as an important step toward the development of functional grafts. In the current work, osteoblast-like cells were seeded on both BCP-NM and PCL-NM. The formed constructs were cultured in a rotating bioreactor (Synthecon, RCSS-1, USA), for different time periods. Cell morphology and viability were assessed by confocal

microscopy. DNA and total protein quantifications were performed accordingly. No significant difference in cell proliferation was observed in BCP-NM and PCL-NM constructs kept under dynamic conditions when compared to the results obtained from static studies. However, under dynamic conditions, total protein contents were higher on BCP-NM constructs than in the uncoated ones. Moreover, PCL-NM presented a higher number of dead cells than BCP-NM. Obtained results point out that BCP-NM can support cell growth under dynamic conditions. The vast potential of using BCP-NM in applications related to bone tissue engineering was also confirmed.

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