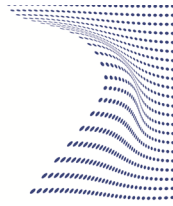




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**UNIVERSITÀ
DEGLI STUDI
DI TORINO**

Doctoral Dissertation

Doctoral Program in Bioengineering and Medical-Surgical Sciences (32nd Cycle)

Bone-like inducing grafts: in vivo and micro-CT analysis

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Summary

Although the use of autografts is still considered the gold standard in bone regeneration, different biomaterials have been proposed for bone replacing. Among them, xenohybrid bone grafts showed excellent results as bone substitutes combining the already-well established features of xenograft with benefits of the blended constituents. The restoration of bone defects seems to be also supported by mesenchymal stem cells (MSCs).

The present dissertation aimed to confirm the role of MSCs, cultured on xenohybrid bone grafts, in bone regeneration promotion and to investigate their interaction/synergy with endothelial stem cells (ECs).

All the bone grafts were assessed through microcomputed tomography (micro-CT), a non-destructive and non-invasive method which allows to quantify the newly formed bone. According to the results, MSCs combined with xenohybrid bone grafts were able to osteodifferentiated and stimulate bone deposition; when MSCs are co-cultured with ECs, they showed a mutual influence on the bone formation which was confirmed in the animal trial.

Considering the potential of osteogenic cells addiction on xenohybrid bone grafts, further researches are still required to transfer the acquired knowledge in humans.