
This in-vivo study examines the effects of modified Ti implant surfaces on the osteogenic phenotypic differentiation of human Mesenchymal Stem Cells (hMSCs). Effects are measured by analyzing extracellular matrix (ECM) mineralization and osteogenic marker expression over 21 days in cell culture. The authors hypothesize a mechanism underlying the improved clinical performance of rough and rough hydrophilic Ti implants is through a mechanism that when exerted upon adult stem cells to accelerate differentiation into osteoblasts, results in the formation of *de novo* bone with superior quality and structure.

The strength and mechanical properties of the newly formed bone is in part determined by the collagen to mineral fraction. It is known that a higher mineral content is associated with higher fracture resistance.\(^1\),\(^2\) Comparing treatment groups, the authors assessed the expression of phenotypic changes in hMSCs through: 1) transcriptional differences of the osteogenic regulatory Runx2/CBFA1 transcription factor, 2) extra cellular matrix molecules Osteopontin (OP/BSP1/SPP1), and 3) bone sialoprotein type 2 (BSP2/IBSP).

Results indicate an improved performance of roughened hydrophilic implants. If the response mechanism is due to differential production of collagen and mineral deposition, then this research has identified an area of cellular reactions that could be incorporated into orthopedic and dental implant clinical practice to enhance the efficacy of implants. These or similar modifications to implant surfaces could be tailored to optimize these responses, or growth factors that have similar effects could be used as implant coatings.

This possibility has important implications in the development of both orthopedic and dental implants. Naturally, it will be necessary to confirm these findings with in vivo animal studies to ensure that the in vitro data is transferable.

The two professions of orthopedics and implant dentistry share common goals and difficulties. We have learned from each other in the past and maybe it is time to formalize some of this learning by holding mutual bone and implant seminars where members of each profession can present and learn from each other. Interestingly, this article from the orthopedic centered journal *Bone* cites 6 dental journals.\(^3\)–\(^8\) Minimally we should be monitoring each other’s peer-reviewed literature and this article is just one example.

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**REFERENCES**