

**OSTEOGENIC CAPACITY OF MAGNESIUM-INCORPORATED  
NANOSTRUCTURED TITANIUM BONE IMPLANT SURFACE**

Park J.-W.

*School of Dentistry, Kyungpook National University, Daegu , 41940, Republic of Korea,  
e-mail: jinwoo@knu.ac.kr*

Surface nanofeatures and chemistry modification using bioactive ions are important in the modern load-bearing titanium bone implants to increase early bone regeneration capacity.<sup>1-2</sup> Magnesium ions are known to activate intracellular signaling that regulates osteogenesis-related cascade.<sup>3-4</sup> This study investigated the effect of nanotopographical and chemical surface modification of commercial titanium oral implants by wet chemical treatment using magnesium ions on early osteogenic function of mesenchymal stem cells in order to obtain insight to future surface design of titanium implants that have enhanced bone healing capacity. Results indicate that magnesium-containing nanostructured titanium surface promotes early osteogenic differentiation of mesenchymal stem cells through the enhancement of focal adhesion development and inhibition of phosphorylation of  $\beta$ -catenin. These results suggest that surface modification of microstructured titanium implants with magnesium-containing nanostructures would be a promising approach to enhance implant osseointegration by enhancing early cellular events and the stabilization of intracellular  $\beta$ -catenin of osteoprogenitor cells during the early stages of bone healing.

References

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