PR-II-6. Evaluation of Osteoblastic Differentiation on two different Titanium surfaces Using Reporter Gene

Ji-Yoon Lee[1,2*], Kyoung-Hwa Kim[1], Yoon-Jeong Park[3], Yong-Moo Lee[1], In-Chul Rhyu[1], Dong-Soo Lee[4], Seung-Jin Lee[5], Chong-Pyoung Chung[1], Yang-Jo Seol[1],

1 Dept. of Periodontology, School of Dentistry, Seoul National University
2 Dept. of Periodontology, Gil Dental Hospital
3 Dept. of Craniomaxiilfacial Reconstructive Science, School of Dentistry, Seoul National University,
4 Dept. Nuclear Medicine, School of Dentistry, Seoul National University
5 College of Pharmacy, Ewha Womans University

Background

The aim of this study was to evaluate the versatility of the bioluminescent reporter gene, as a useful method to investigate osteoblastic differentiation, by comparing the osteoblastic differentiation in rough and smooth titanium surfaces and in different growth environment.

Materials and methods

Acid-etched, large grit sandblasted (SLA) and machined titanium disks were placed in each well of six-well plate. Mouse oseocalcin gene promoter-transfected, MC3T3-E1 cells, preosteoblastic stable cell line, were seeded either on titanium disks or on the plastic base of control wells respectively, and cultured either in Dulbecco's Modified Eagle Medium (DMEM) with 10% fetal bovine serum (FBS) and 1% antibiotics (routine growth media) or in DMEM with 1% antibiotics, 15% FBS, 5x10-7 M Dexamethason, 0.5% ascorbic acid, 10 μM β-glycerolphosphate (mineralizing media). Ostelcalcin production and Luciferase activity was measured at 1,3,7,14,21 and 28 days.

Results

The osteocalcin production was increased with time in all groups. Rough surface and BMP-treated groups showed a significant increase of osteocalcin production. Luciferase expression showed a greater intensity in rough surface and mineralized media.

Conclusion

Genetically modified cells expressing reporter gene can be utilized to evaluate osteoblastic differentiation.