Effect of 830nm Laser Phototherapy on Osteoblasts Grown in Vitro on Biosilicate Scaffolds

Author

Muniz Renno, Ana Claudia, McDonnell, Pauline Ann, Crovace, Murilo Camuri, Zanotto, Edgar Dutra, Laakso, Liisa

Published

2010

Conference Title

PHOTOMEDICINE AND LASER SURGERY

DOI

10.1089/pho.2009.2487

Tissue Engineering Part A

Abstracts—bone-tec 2009 Meeting Abstracts : International Bone-Tissue-Engineering Congress October 8–11, 2009 Hannover, Germany

To cite this article:
Tissue Engineering Part A. August 2010, 16(8): A-1-A-29. doi:10.1089/ten.tea.2010.1500.

Published in Volume: 16 Issue 8: August 5, 2010

P-16 Effect of 830nm Laser Phototherapy on Osteoblasts Grown in Vitro on Biosilicate_ Scaffolds

A.C. Renno, P.A. McDonnell, M.C. Crovace, E.D. Zanotto, E.L. Laakso
Federal University of Sao Paulo, Brazil

The purpose of this study was to develop a method for successfully seeding osteoblasts onto a glass-ceramic scaffold designed for use in clinical settings; and, determine whether the application of laser phototherapy at 830nm would result in osteoblast proliferation on the glass-ceramic scaffold.
The use of bioscaffolds is considered a promising strategy in a number of clinical applications where tissue healing is sub-optimal. As in vitro osteoblast growth is a slow process, laser phototherapy could be used to stimulate osteoblast proliferation on bioscaffolds.
A methodology was developed to seed an osteoblastic (MC3T3) cell line on to a novel glass-ceramic scaffold. Seeded scaffolds were irradiated with a single exposure of 830nm laser at 10 J=cm2 (at diode). Non-irradiated seeded scaffolds acted as negative controls. Cell proliferation was assessed 7 days after irradiation.
Osteoblastic MC3T3 cells were successfully grown on discs composed of a glass-ceramic composite. Laser irradiation produced a 13% decrease in MC3T3 cell proliferation on glass-ceramic discs (meanþ=_SD¼0.192þ=_0.002) compared to control (non-irradiated) discs (meanþ=_SD¼ 0.22þ=_0.002).
Despite successful seeding of bioscaffolds with osteoblasts, laser phototherapy resulted in a reduction in cell growth compared to non-irradiated controls. Future research combining laser phototherapy and glass-ceramic scaffolds should take in to account possible interactions of the laser with matrix compounds.