IJAE
Vol. 117, n. 2 (Supplement): 168, 2012
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

Cell adhesion and proliferation on gelatin-ascorbic acid scaffold

Viviana Salvatore[1], Isabella Orienti[2], Stefano Focaroli[1], Sandra Durante[1], Monica Mattioli Belmonte[3] and Mirella Falconi[1]

[1] Department of Anatomical Sciences, University of Bologna, Bologna, Italy
[2] Department of Pharmaceutical Sciences, University of Bologna, Bologna, Italy
[3] Department of Clinical and Molecular Sciences, Università Politecnica delle Marche, Ancona, Italy

The aim of this study was to combine gelatin and ascorbic acid to produce a scaffold with antitumoral properties. Gelatin was chosen because is a derivative of collagen, the major constituent of skin, bones and connective tissues, and because it does not exhibit antigenicity. Ascorbic acid had been reported for many years to have varying effects on tumor cells, using models such as hepatoma, pancreatic and colon cancer, sarcoma, leukemia, prostate cancer and mesothelioma. The chemical, physical and biological properties of this gelatin/ascorbic acid scaffold, including morphology by high resolution SEM analysis, swelling ratio and degradation rate were studied. Cell proliferation assay was performed to compare osteosarcoma cell line (MG-63) and human fibroblast cells (HGF), in order to verify the effects of the scaffold on cell growth, proliferation and cell adhesion.

The scaffold was hydrated in cell medium for 24 h. The swelling ratio and degradation rate were performed starting from 1 to 7 days. MG-63 cells and HGFs were seeded on hydrated scaffolds and MTT test and high resolution SEM analysis were performed at 24hr, 3, 7 and 10 days.

The swelling ratio showed an absorption of about 10 times of its dry weight and a degradation starting from 6 days. High resolution SEM analysis revealed a good porosity, that facilitated the attachment of cells and their migration inside the scaffold. MTT test showed a different proliferation pattern for the two cellular types.

The results proved that gelatin/ascorbic acid scaffold has properties of biocompatibility and has a different effect on cell proliferation.

References

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Keywords: Scaffold, ascorbic acid, gelatin, cytotoxycity, cell proliferation, antitumoral activity.