Biocompatibility of differently cross-linked collagen membranes


**Results**

The density of both periodontal ligament (PDL) fibroblasts and osteoblast-like cells was highest on Geistlich Bio-Gide® after 7 days of culturing.

**Conclusion**

Geistlich Bio-Gide® promotes the attachment and the proliferation of human PDL fibroblasts and human osteoblast-like cells best.

**Study design**

- *In vitro* evaluation of biocompatibility in cell cultures of (1) human PDL fibroblasts and (2) human osteoblast-like cells.
- Six specimens of each membrane were cultured with the PDL fibroblasts (n=24) or the osteoblast-like cells (n=24) for 7 days.
- Adherent cells were stained with hematoxylin and counted using a light microscope; the cell density per square millimetre was calculated.
Biocompatibility of various collagen membranes in cultures of human PDL fibroblasts and human osteoblast-like cells


Abstract

The aim of the present study was to evaluate the biocompatibility of differently cross-linked collagen membranes in cultures of human PDL fibroblasts and human osteoblast-like cells. Four collagen membranes [BioGide® (BG), BioMend® (BM), Ossix® (OS) and TutoDent® (TD)] were tested. Cells plated on culture dishes (CD) served as positive controls. Six specimens of each membrane were incubated with (1) human PDL fibroblasts [2 x 10⁴ cells] (n=24), and (2) human osteoblast-like cells (SaOs-2) [2 x 10⁴ cells] (n=24) under standardized conditions. After 7 days, adherent cells were stained with hematoxylin and counted using a reflected light microscope and the cell density per square millimeter was calculated. Additionally, cell morphology was investigated using scanning electron microscopy (SEM). Cell counts were presented as means and standard deviations (cells/mm²) and analyzed for statistical difference using the Wilcoxon test: (1) CD (434 ± 76)>BG (64 ± 19)=OS (61 ± 8)>TD (44 ± 4)>BM (12 ± 5); (2) CD (453 ± 92)>BG (94 ± 46)>TD (84 ± 49)>OS (41 ± 23)>BM (0). SEM examination revealed that PDL fibroblasts adherent on BG, TD and OS appeared spindle-shaped and flat, like cells on CD. SaOs-2 osteoblasts adherent on CD were star shaped and flat, but mostly round in shape on BG, OS and TD. BM appeared to be incompatible with the attachment and proliferation of SaOs-2 cells; however, a few PDL fibroblasts were found in a round shape. Within the limits of the present study, it was concluded that (i) BG, TD and OS promoted, and (ii) BM inhibited the attachment and proliferation of human PDL fibroblasts and human SaOs-2 osteoblasts.