Dual-layer scaffolds for small-caliber blood vessel tissue engineering

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Masson's Trichrome

* SEM *

These data show that UPy-based thermoplastic elastomers are cell-compatible, can be tailored to

Conclusions

A dual-layer scaffold was constructed from the HDI based TPE and commercially available PGA

Mechanical Properties

Two thermoplastic elastomers (TPEs) based on the strongly dimerizing UPy 1 moiety were evaluated, consisting of an amorphous polyester chain extended with an UPy bisisocyanate containing a bulky

Introduction

Currently, there are no successful artificial small blood vessels for medical use. Methods and materials that have been useful in the surgical repair of large vessels (e.g. synthetic grafts) are non-effective

Cell Compatibility

3T3 mouse fibroblasts were seeded on a cast of the HDI derivative on a glass cover slip. No discernable difference was observed in cell proliferation and adhesion between the polymer film and the glass surface.

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References


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Cell Compatibility

Sheep myofibroblasts were subsequently seeded in a fibrin gel supporting matrix, on the cylindrical dual-layer scaffolds displayed on the left. The resulting constructs were cultured statically for 18 days, and were subsequently harvested for analysis.

Cell Compatibility

Histology below shows efficient seeding, with cells throughout the scaffold. The strongest proliferation and ECM deposition was, however, observed at the edges of the scaffold. Additionally, compaction of the construct is mostly observed in the PGA layer, and the adhesion of the EMC to the TPE material appears relatively poor.

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