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Bachelor's Project Announcement

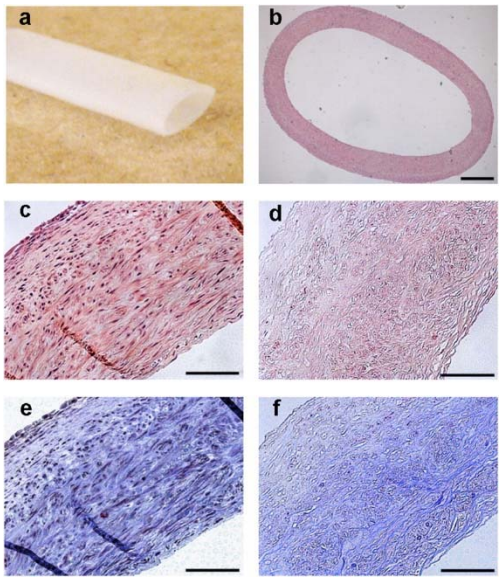
Blood vessel decellularization and its integration to a loop-model for the purpose of in-vitro examination of neurovascular implants

Background

Aneurysms are formed like a "balloon" within a blood vessel in the brain, influenced by repetitive pulsatile blood flow. They grow slowly and with this become weaker, potentially leading to a rupture and consequently to bleeding. Ruptured brain aneurysms are fatal in about 50% of cases. There are several types of minimally invasive endovascular treatment (coil embolization, stent grafts, flow diverters ,etc.). Our aim is to create a test model, which most closely mimics the human vessel biological, anatomical and physical characteristics ,and therefore gives us the best possible results for the in-vitro testing of the above-mentioned stent grafts.

Description

The first step of the project is finding the most suitable animal vessel model (bovine, porcine ,etc.) for the integration in a loop model. The selection of an appropriate animal vessel model needs to include criteria relevant to our physical loop-model (target diameter, length, mechanical strength, ease of handling, availability ,etc.). The selection process will be followed by a literature review of decellularization protocols for the selected species. The conception, realization ,and investigation of the decellularization process, as well as the histological investigation of the decellularized vessels in terms of structure, is also part of the work. Finally, the vessel is integrated and preliminarily tested into the loop model.



Tissue-engineered vessel from porcine before (c,e) and after decellularization (d,f)
Source: https://doi.org/10.1073/pnas.1019506108

Start: Immediately

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