HIGHLIGHT

Aachen,November 2013

Porous tube structures

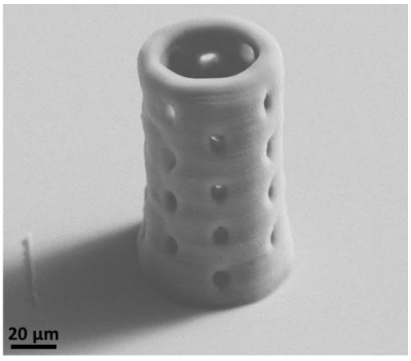

Figure 1: Porous tubular structure fabricated by MPP

Laser based polymerisation technologies are responsible for the realisation of the small diameter vessels. In order to achieve this goal, laser based polymerisation processes have to be investigated to fit the needs of the vessels. The requirements can be met with different laser processes. Multiphoton polymerisation and UV induced polymerisation were investigated in order to find the best suited process for the project.

Structuring of vessels by multiphoton polymerisation will allow the generation of very small structures with wall thicknesses of few µm. The tubes can be structured with pore diameters of 5µm (Fig.1). Due to the high resolution the process speed is very low. An alternative strategy to increase process speed is the polymerisation by UV-light. This method allows the structuring of larger vessels with a length of 30mm. Generating pores with diameters of 5-10µm into these vessels was achieved by laser drilling (Fig.2). For special angiogenesis assays porous membranes, made from the vessel wall material have been prepared by direct laser structuring. The pores have a diameter of 50x75µm² (Fig.3).

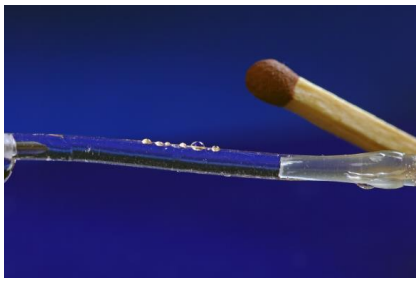

Figure 2: Drilled porous tube sample for angiogenesis assays

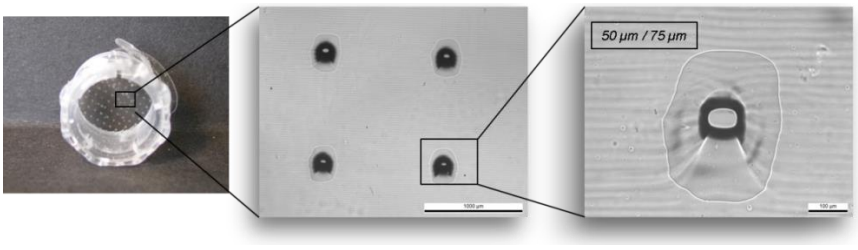

Figure 3: Porous membrane prepared by UV laser-crosslinking

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