Supporting Information

Injectable Glycosaminoglycan Based Cryogels from Well-defined Microscale Templates for Local Growth Factor Delivery

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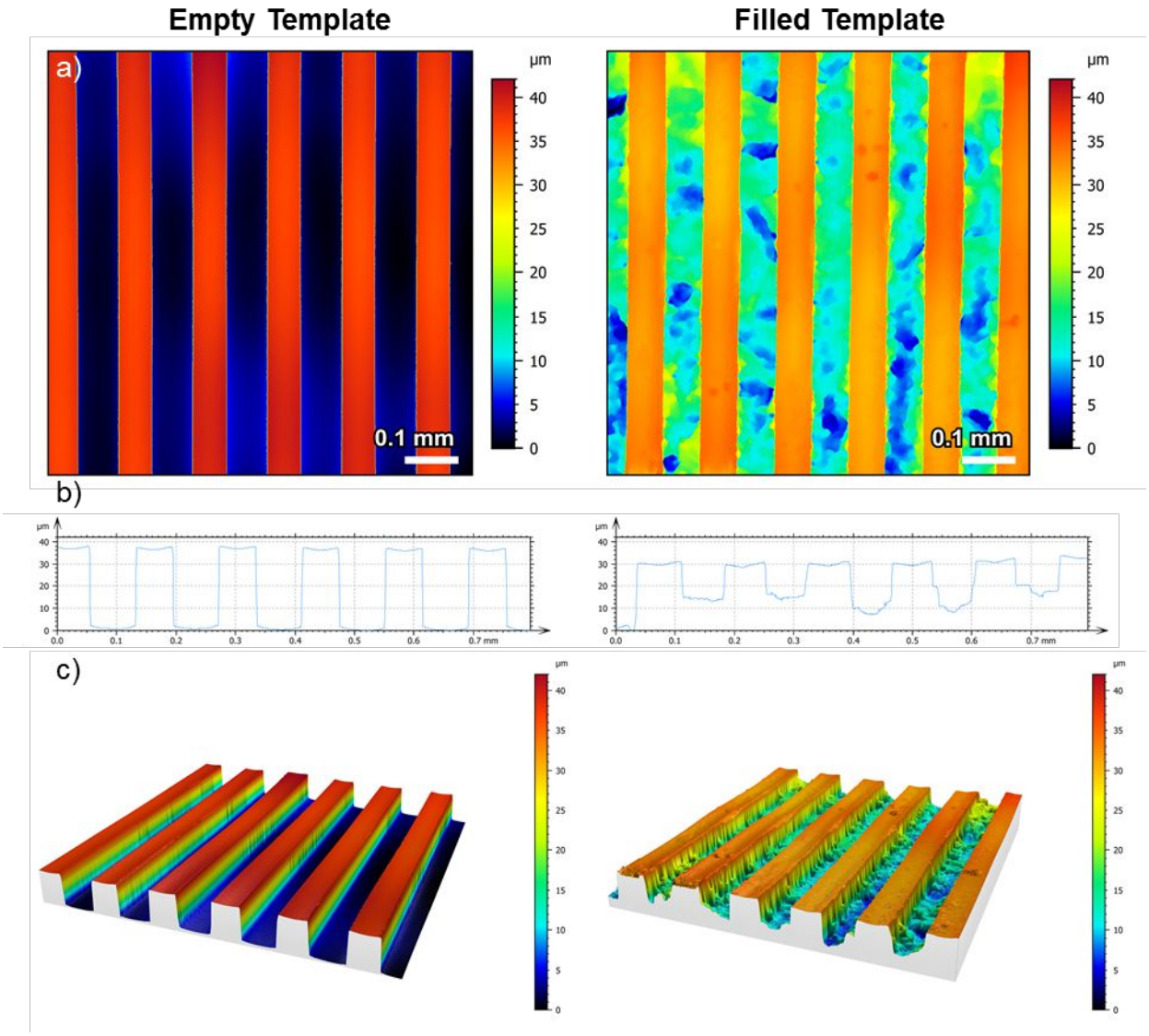

Figure S1 – showing template characterization of the 70µm wide channels via multi-pinhole confocal microscopy (NanoFocus) using µsoft metrology software. Both empty (left hand side) and filled (right hand side) template were analyzed showing the surface view (a), profile measurement (b) and a 3D render of the template (c).

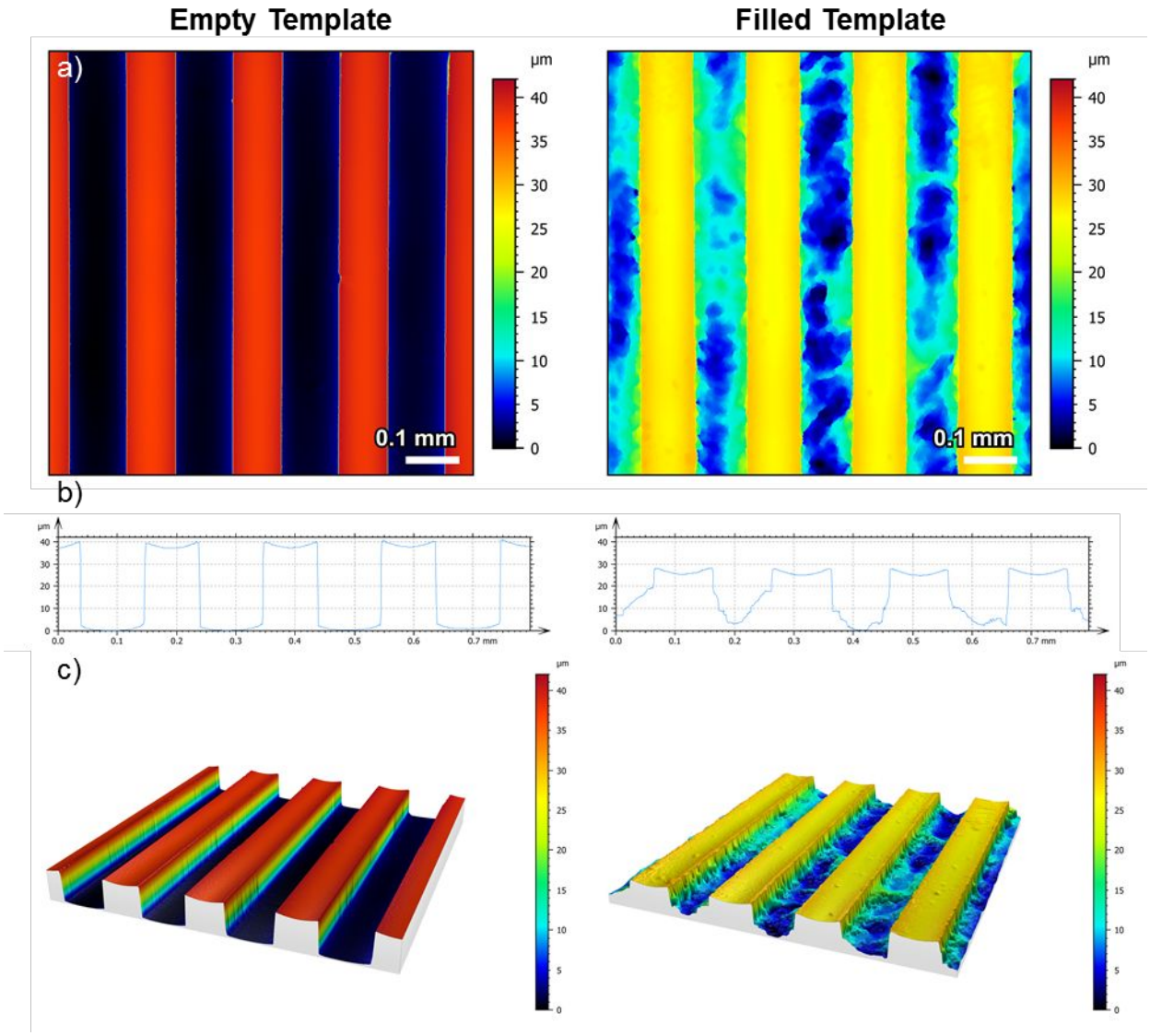

Figure S2 – as above, showing template characterization of the 100µm wide channels both empty (left hand side) and filled (right hand side).

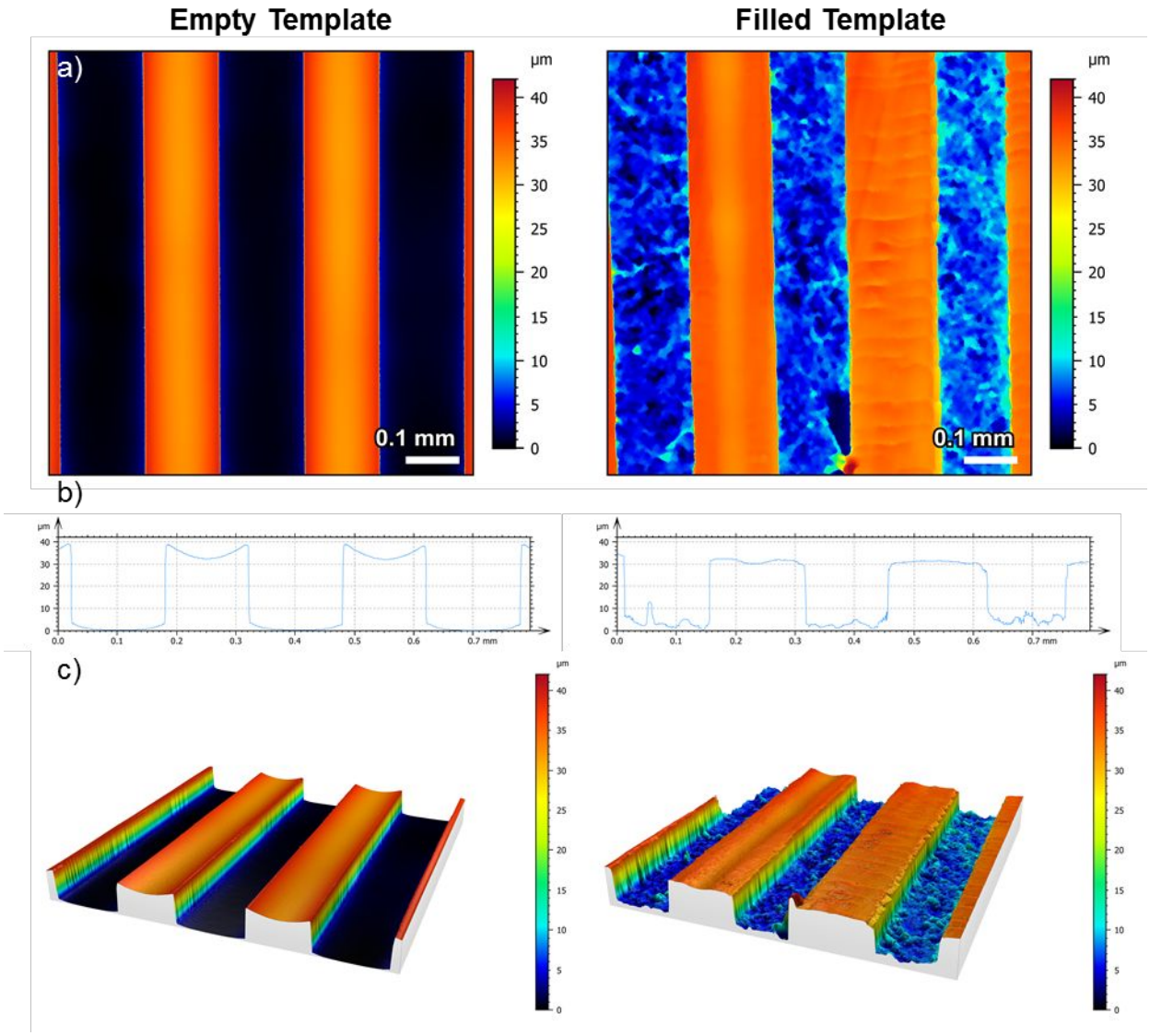

Figure S3 – showing template characterization of the template with largest channel size (150µm wide channels) both empty (left hand side) and filled (right hand side).

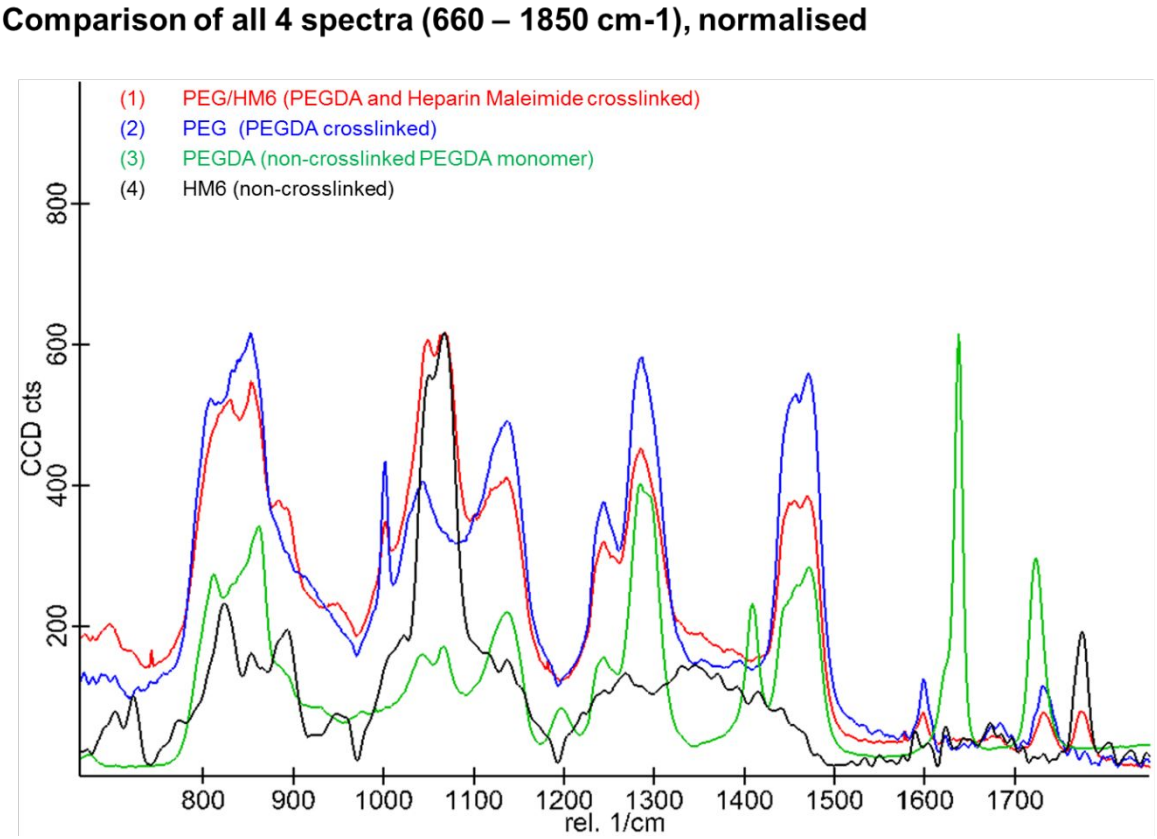

Figure S4 – Raman spectroscopy analysis of the non-crosslinked PEGDA monomer (green), the maleimide modified heparin (black), a sample of crosslinked PEGDA (without heparin, blue) and the PEGDA/heparin cryogels (red).

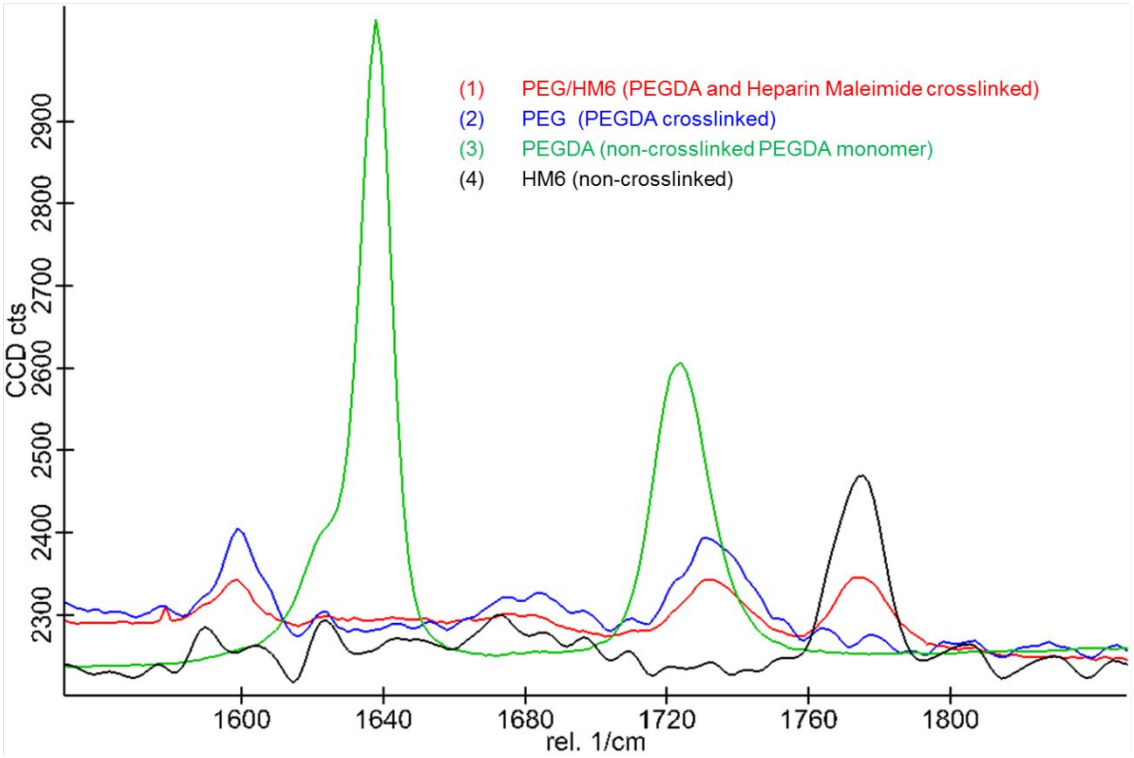

Figure S5 – Raman spectroscopy analysis of the non-crosslinked PEGDA monomer (green), the maleimide modified heparin (black), a sample of crosslinked PEGDA (without heparin, blue) and the PEGDA/heparin cryogels (red) showing the reduction in the peak at 1640 cm^{-1} and 1774 cm^{-1} (green/black to red) due to the reaction of the maleimide with the acrylate.

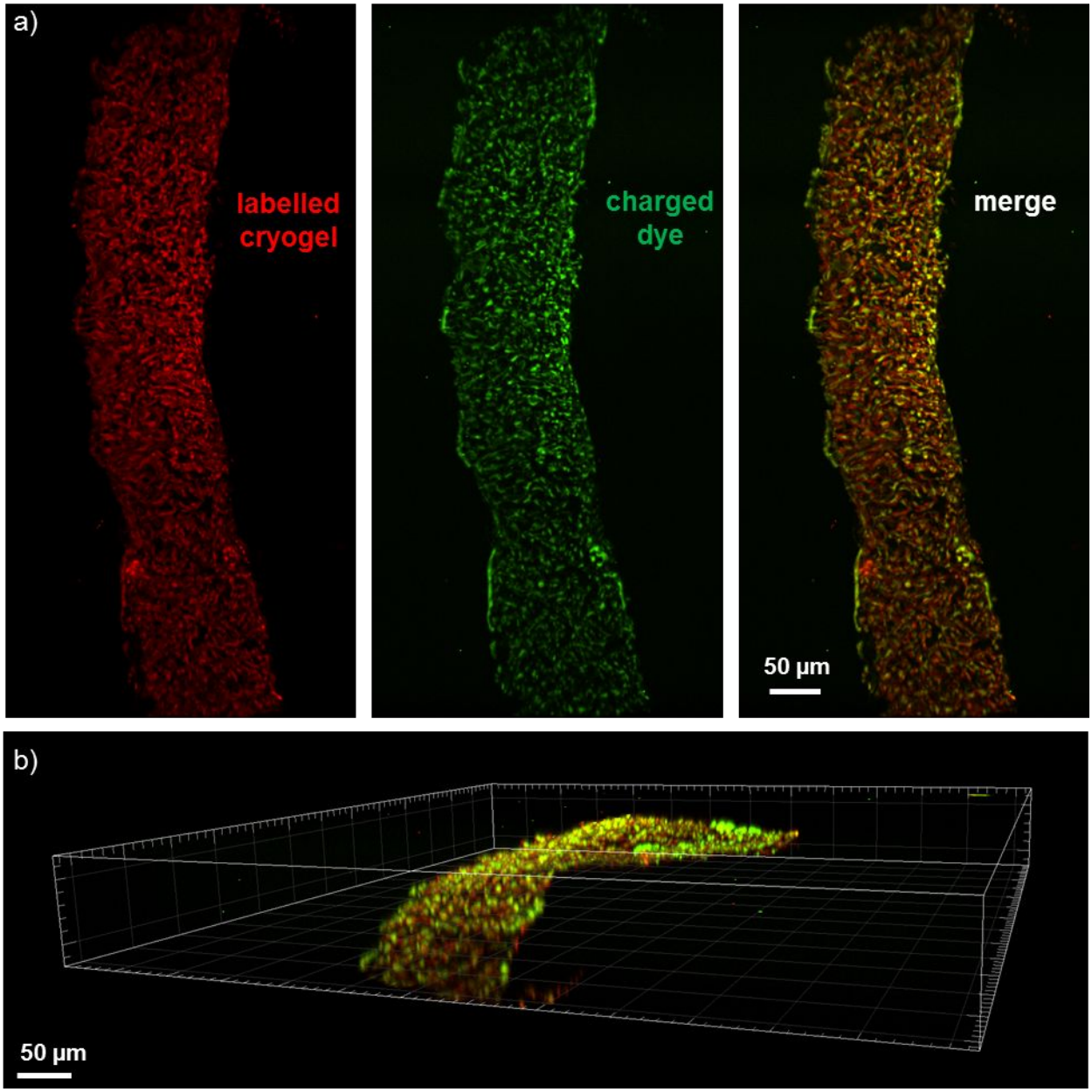

Figure S6 – (a) confocal laser fluorescence microscopy of an ATTO 647 labelled cryogel (red) that had been submersed in a solution of the positively charged, fluorescent doxorubicin molecule (green). Since doxorubicin binds to heparin, this method was used to indirectly show the distribution of heparin throughout the cryogel structure (merge panel). The same cryogel image shown in three dimensions (b) also confirms an even distribution of heparin throughout the cryogel, though there are some areas with more green intensity (indicating more heparin) and areas of more red intensity (indicating less heparin).

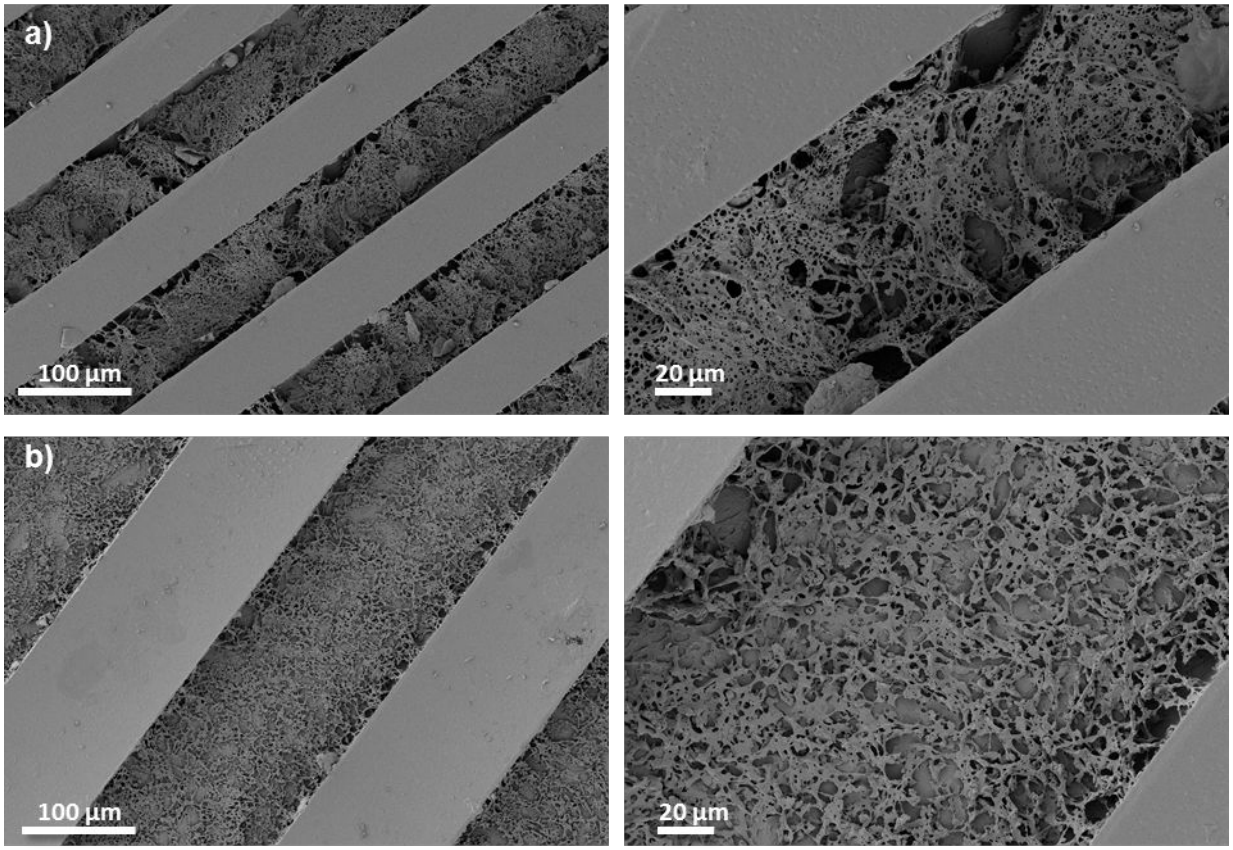

Figure S7 – Scanning electron microscopy analysis of cryogel filled templates with a channel width of 70 µm (a) and 150 µm (b).

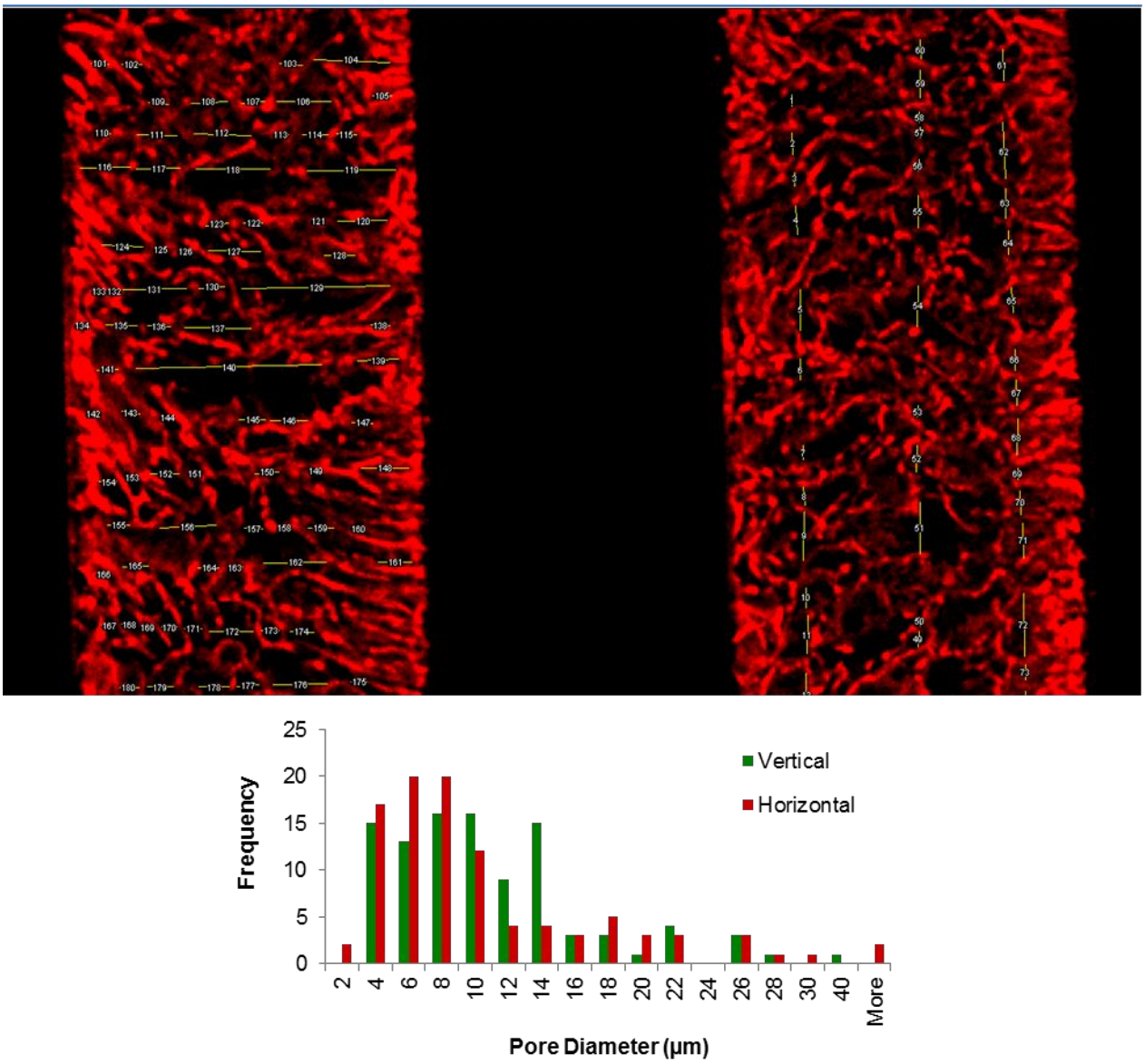

Figure S8 – Pore size analysis, showing an example image of the measurements made using ImageJ software, and the subsequent pore diameter distribution below. The average pore size was 9.9 µm when an average of the vertical and horizontal measurements was made.

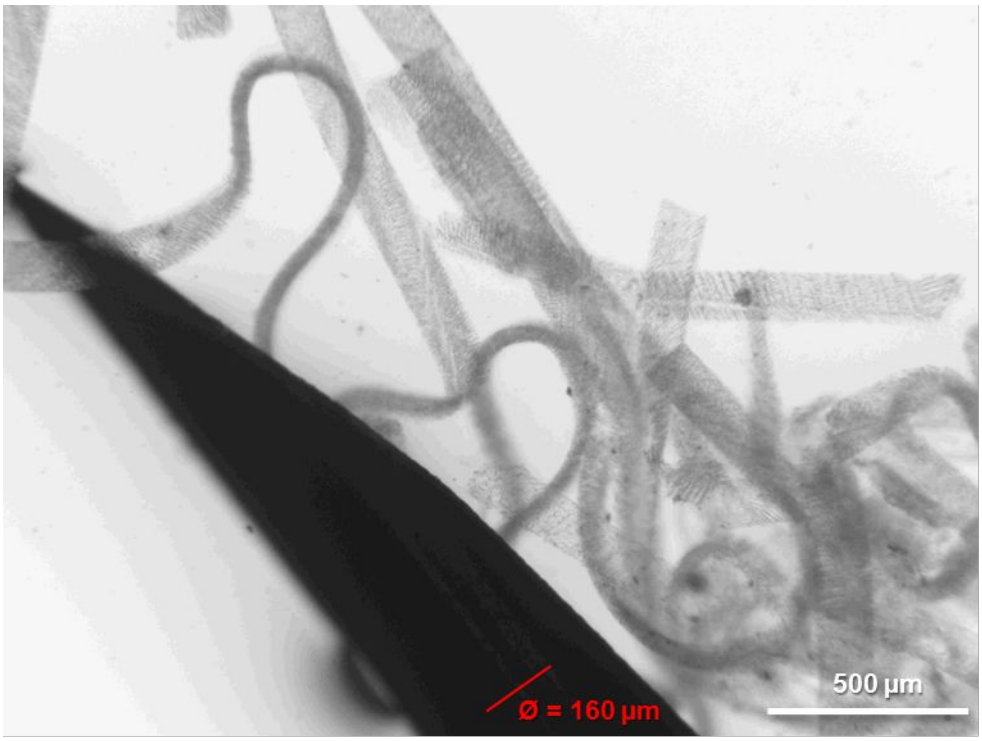

Figure S9 – A light microscope image taken after cryogel scaffolds (100 µm diameter) were injected out of a 30 gauge needle (inner diameter represented to scale).

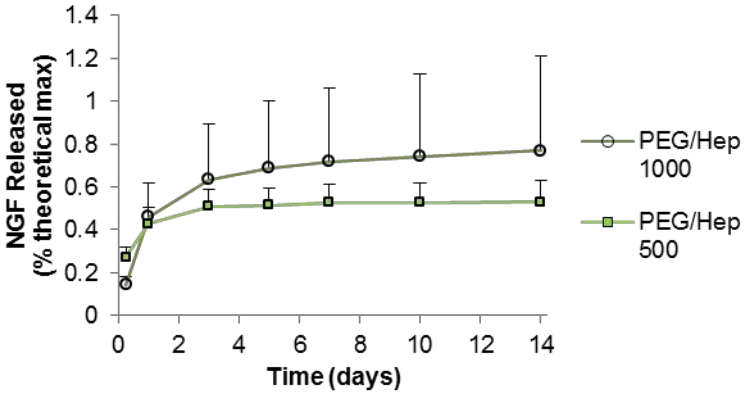

Figure S10 – nerve growth factor release as a percentage of the total growth factor loaded to the cryogel scaffold showing that only a small fraction of the growth factor is released (n=3) (error bars represent the cumulative value of standard deviation).