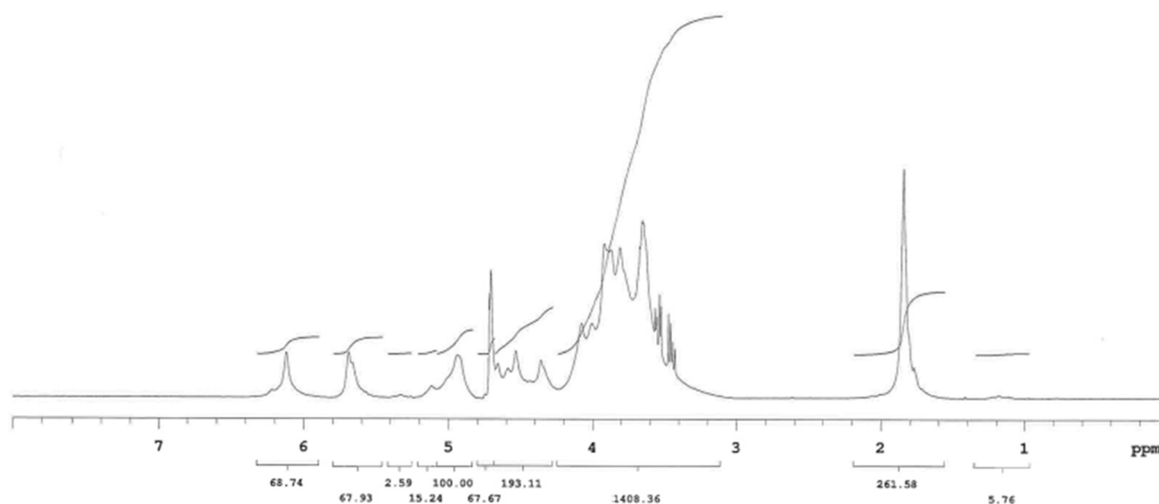
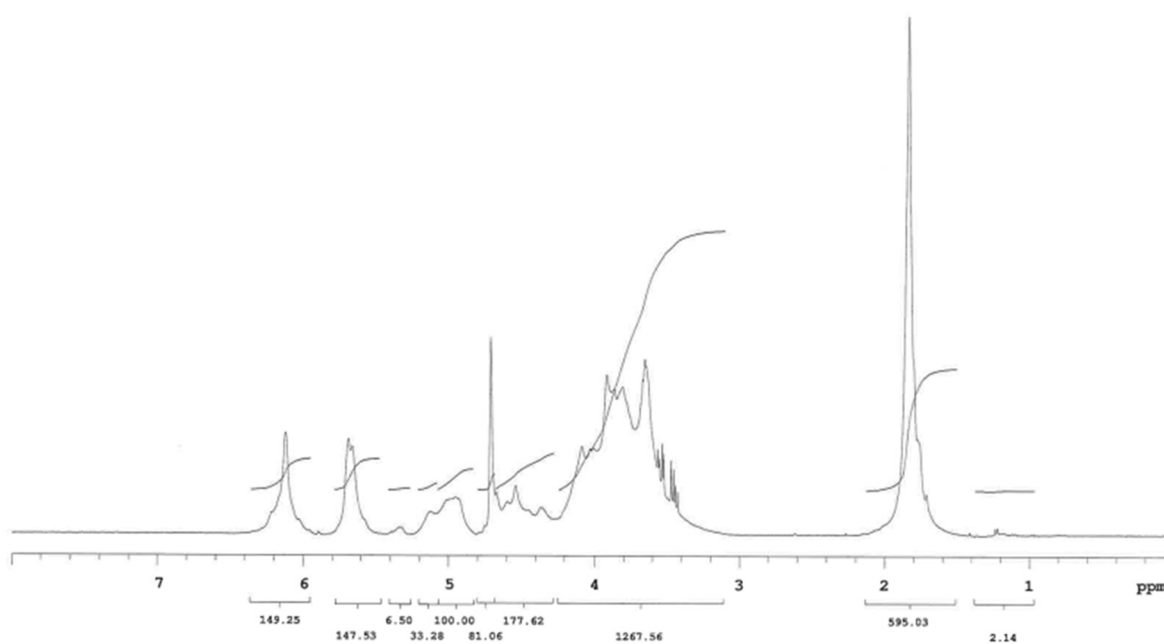


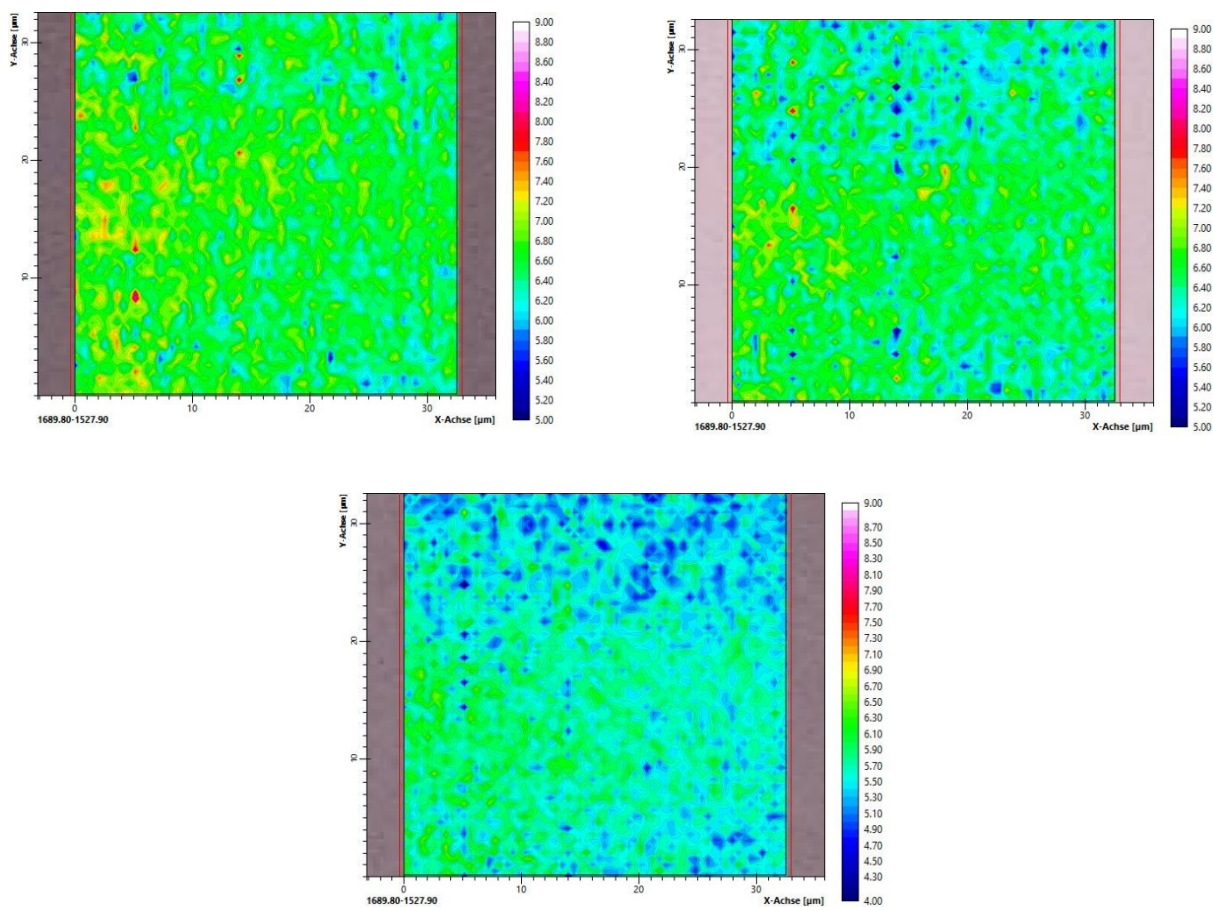
## Supporting Information



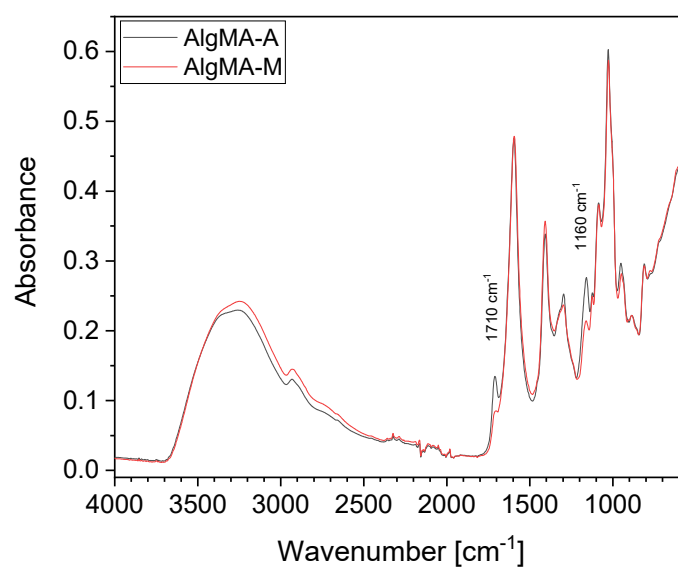
**Figure S1.** <sup>1</sup>H-NMR spectrum of the methacrylated alginate with a low degree of substitution (L hydrogels)



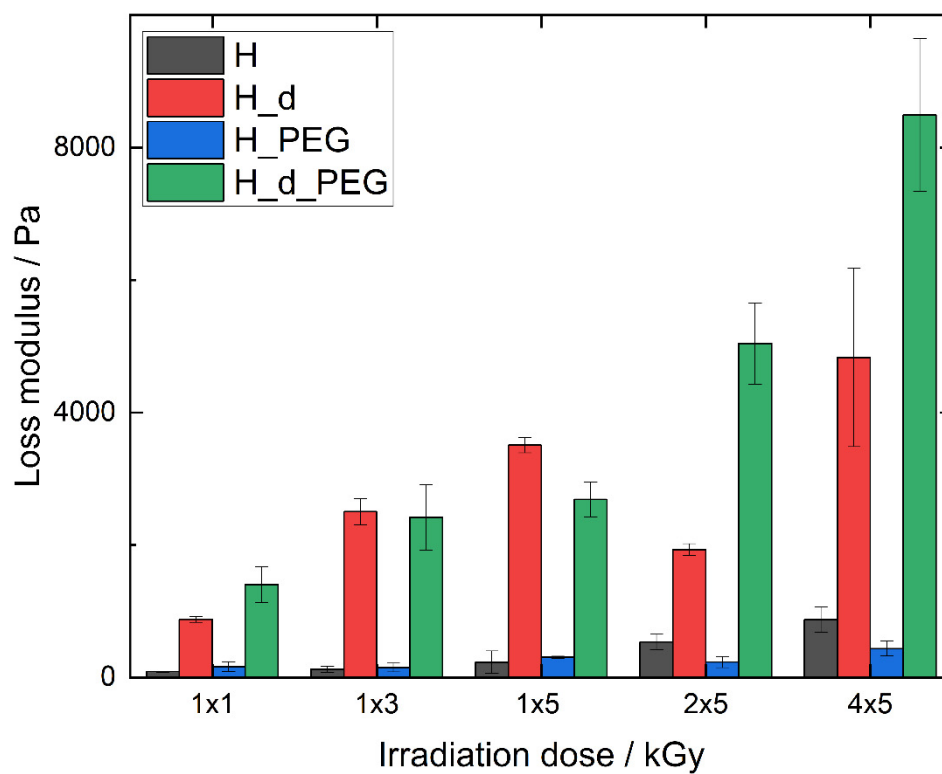
**Figure S2.** <sup>1</sup>H-NMR spectrum of the methacrylated alginate with a high degree of substitution (H hydrogels)



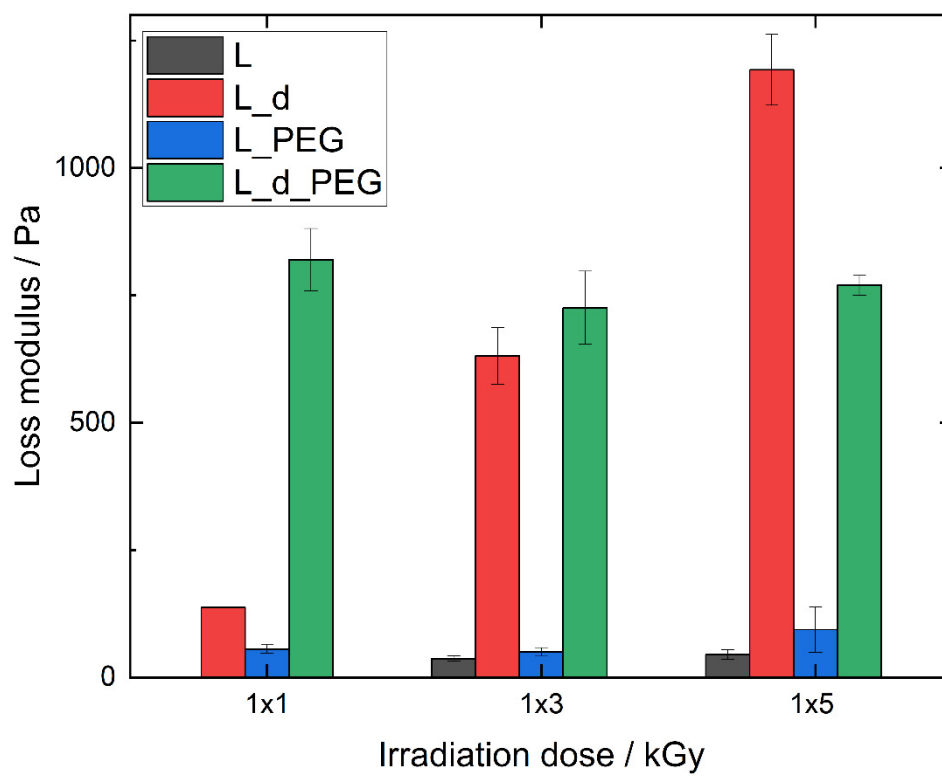
**Figure S3.** FTIR microspectral imaging of L\_PEG after irradiation with an electron dose of 1x3 kGy (top left), 1x5 kGy (top right) and H\_PEG after irradiation with an electron dose of 1x5 kGy (bottom).



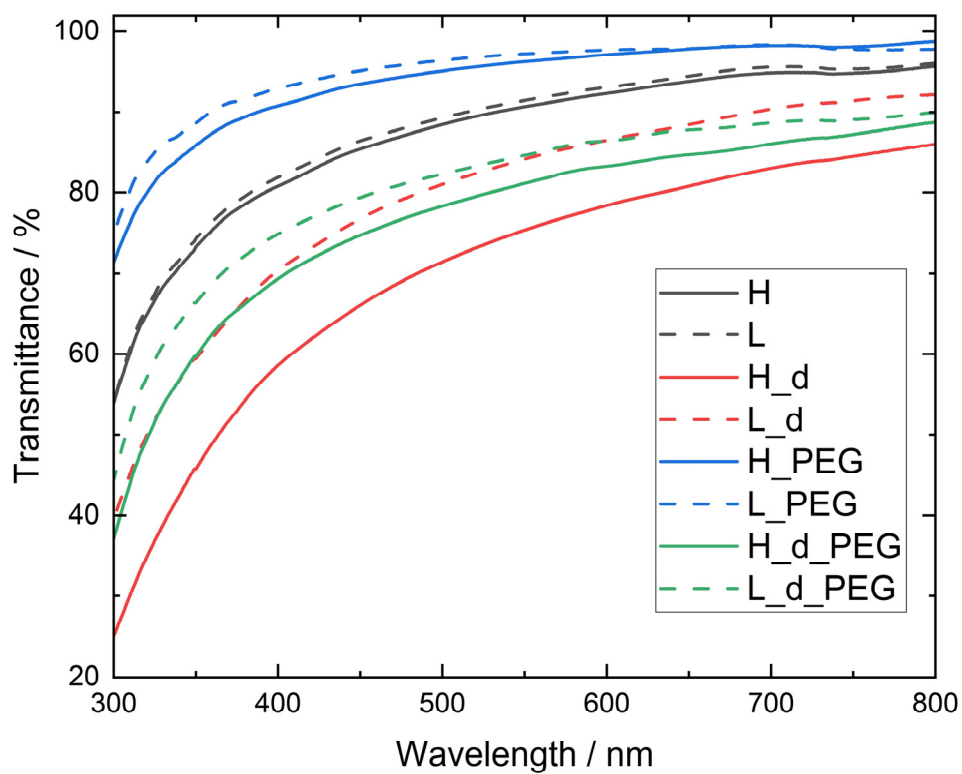
**Figure S4.** FTIR/ATR spectra of ALGMA H and ALGMA L after their functionalization.



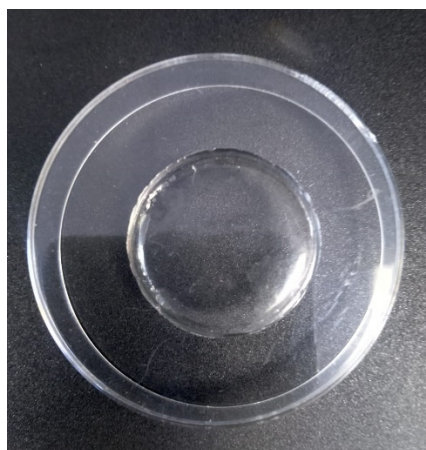
**Figure S5.** Loss modulus of AlgMA H hydrogels



**Figure S6.** Loss modulus of AlgMA L hydrogels



**Figure S7.** Frequency sweep with UV-VIS to measure the transparency of the polymers (1x5 kGy)



**Figure S8.** Visualization of the irradiated samples inside a petri dish indicating the transparency. The outer diameter of the petri dish is 55 mm.