Supplementary Information

A bioinspired multifunctional hydrogel patch targeting inflammation and regeneration in chronic intestinal wounds

Marco Araújo,*a,b João Silveira,a,b,c Aureliana Sousa,a,b Mafalda Bessa-Gonçalves,a,b,d Susana G. Santos,a,b,d and Cristina C. Barrias,*a,b,d.

a i3S - Instituto de Inovação e Investigação em Saúde, Universidade do Porto, Porto, Portugal

b INEB - Instituto de Engenharia Biomédica, Universidade do Porto, Porto, Portugal

c FEUP – Faculdade de Engenharia, Universidade do Porto, Porto, Portugal

d ICBAS - Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto, Porto, Portugal
**Figure S1.** ATR-FTIR spectrum of alginate samples before (AlgHMW) and after modification with methacrylic anhydride (AlgMa) and grafting of the cell-adhesive peptide (AlgMaRGD). ATR-FTIR spectrum of cell-adhesive peptide CGGGGRGDSP (RGDSH).
Figure S2. Macroscopic aspect of hydrogel formulations Pep4 (A) and mNP0.3Pep4 (D, G) and representative images of the spongy-like appearance of freeze-dried Pep4 (B, C) and mNP0.3Pep4 (D-I) scaffolds obtained from 14 µL (A-F) and 80 µL (G-I) of precursor solution. It is well observed the 3D aspect of the spongy scaffolds and the presence of mNP.
Figure S3. A: Concentration of pendant thiol groups on hydrogel matrices containing 4 mM and 8 mM of bisthiolated MMP-cleavable peptide without mNP (Pep4, Pep8), with 0.3 mNP (mNP0.3Pep4 and mNP0.3Pep8) and 0.45 mNP (mNP0.45Pep4 and mNP0.45Pep8). B: Amount of bisthiolated peptide in 4 mM and 8 mM solutions containing 0.05 wt% Irgacure 2959 before (0 min) and after photopolymerization (5 min).

Figure S4. Strain-sweep (A) and frequency-sweep (B) tests performed on sample mNP0.3Pep4. Analysis were performed from 0.1-100% at 0.1 Hz frequency and from 0.01-10Hz maintaining 1% strain, which are both in the linear viscoelastic region.
Figure S5. Layout of the 48-well plate (A) containing mNP0.3Pep4 hydrogel samples incubated in a cocktail solution composed by Collagenase type II + Collagenase type IV (10U + 200U), at 37 °C and along 14 days (B). Amplified photo of the mNP0.3Pep4 hydrogels (C).

Video S1. 3D rotating projection of HIFs and Caco-2 co-culture

Supplementary movie 1.mov