Electronic Supplementary Material (ESI) for Soft Matter.

Supporting information

Microwave-assisted synthesis of TEMPO-labeled hydrogels traceable with MRI

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NMR and IR spectra of PEG-TEMPO 4

^{1}H NMR (400 MHz, DMSO-d_6) δ 7.93 (s, 2H), 4.53 (m, 6H), 4.30 (m, 2H), 3.83 (m, 6H), 3.76 (m, 4H), 3.54 (s, 180H), 1.90 (m, 4H), 1.46 – 1.27 (m, 4H), 1.11 (s, 12H), 1.07 (s, 12H).

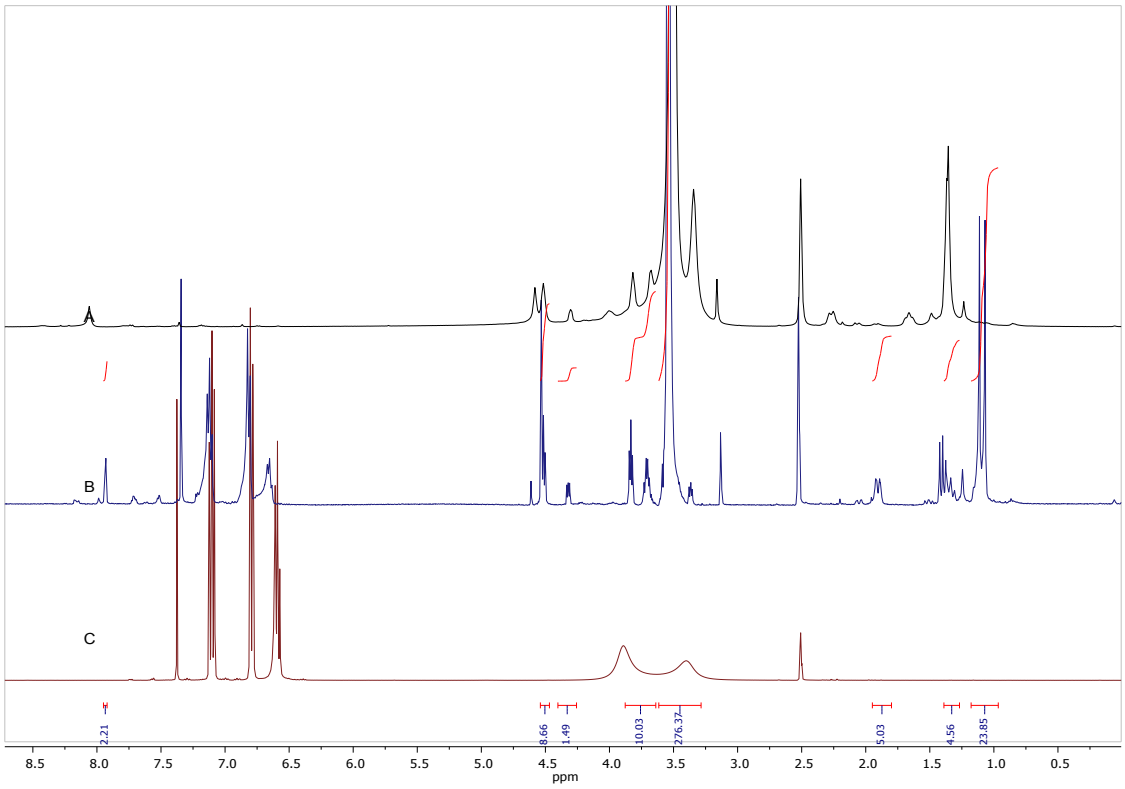

Figure S1. ^{1}H-NMR spectra of: (A) PEG-TEMPO in DMSO-*d6*, (B) after addition of phenylhydrazine in the NMR tube, (C) phenylhydrazine.

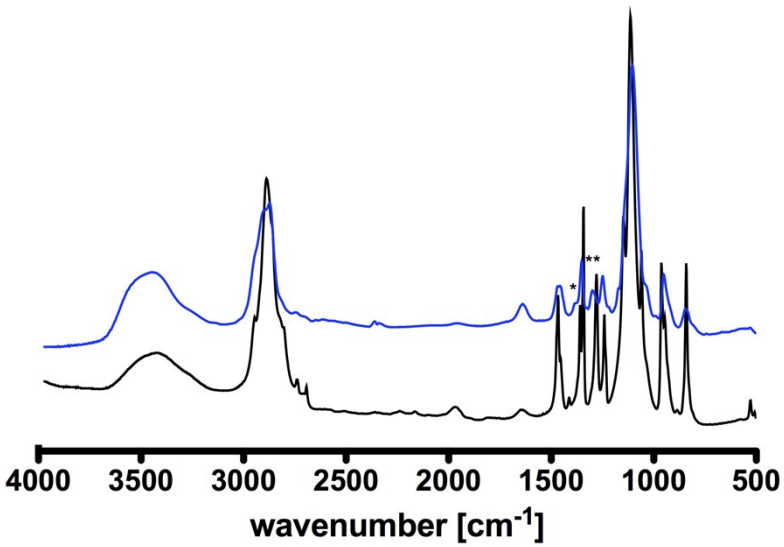

Figure S2. FT-IR spectrum of PEG (black) and PEG-TEMPO (blue).

Gel permeation chromatography of PEG-TEMPO

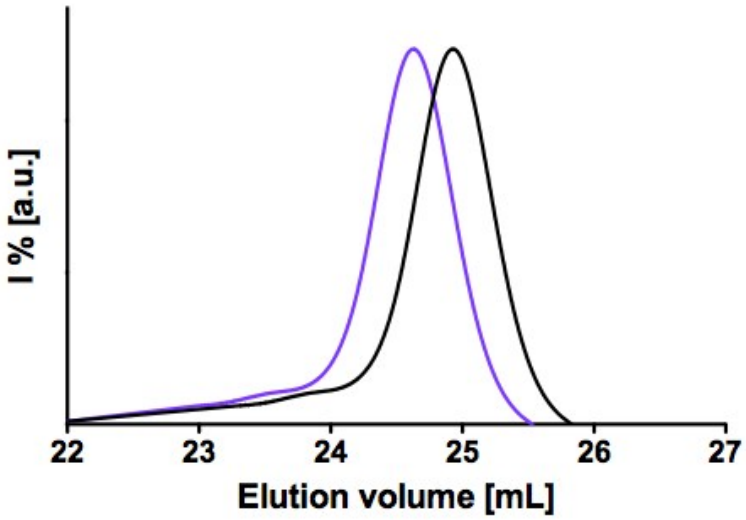

Figure S3. GPC analysis of PEG 2000 (black line) and PEG-TEMPO (blue line).

***In vitro* cytocompatibility of PEG-TEMPO**

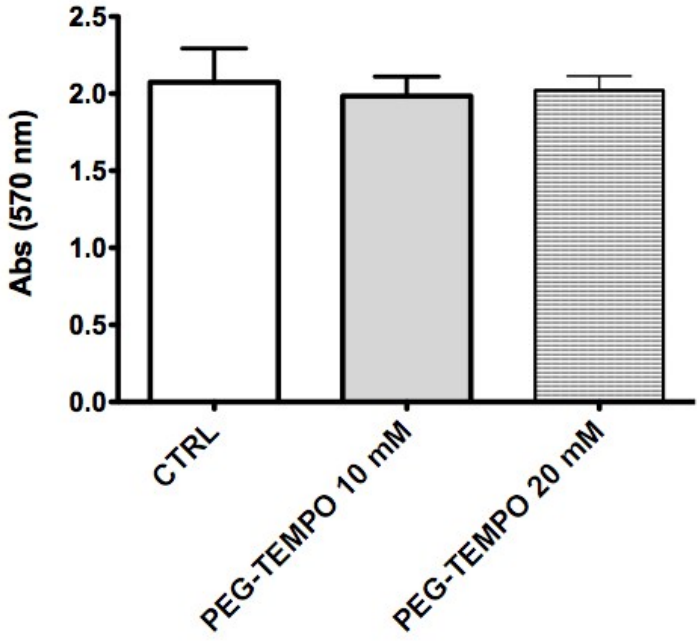

Figure S4. L929 viability after incubation for 3 days in the presence of PEG-TEMPO at the same concentrations used for MRI experiments (10 and 20 mM). The left bar corresponds to the untreated control (CTRL). The columns represent the mean ± S.D.; n = 3.

Rheology of gel-TEMPO

The presence of TEMPO within the polymeric network does not affect the rheological properties of the composite material (Figure S4). Comparing neat system with gel-TEMPO the G′ increment is evident: the functionalized material presents stiffer and more elastic properties with respect to neat hydrogel that could be attributed to the interactions between hydrogel network and TEMPO pendant groups. Also in this case the influence of TEMPO is not so dominant due to the integration of polymer chains and absence of high steric hindrance. Moreover this influence is independent on the two TEMPO concentrations used.

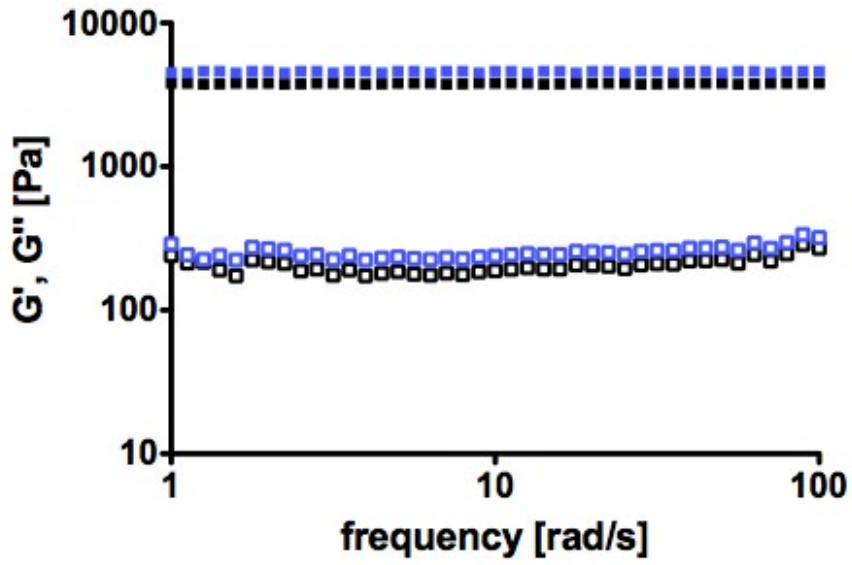

Figure S5. Rheological analyses: dynamic frequency sweep test of neat hydrogel (black) and gel-TEMPO (blue) at 37 °C with small oscillatory shear in the linear viscoelastic regime.