SUPPLEMENTARY MATERIALS

$$\tau_m = \alpha_1(\%)\tau_1 + \alpha_2(\%)\,\tau_2$$

Scheme S1. Formula for the mean fluorescence lifetime of a biexponential decay fitting

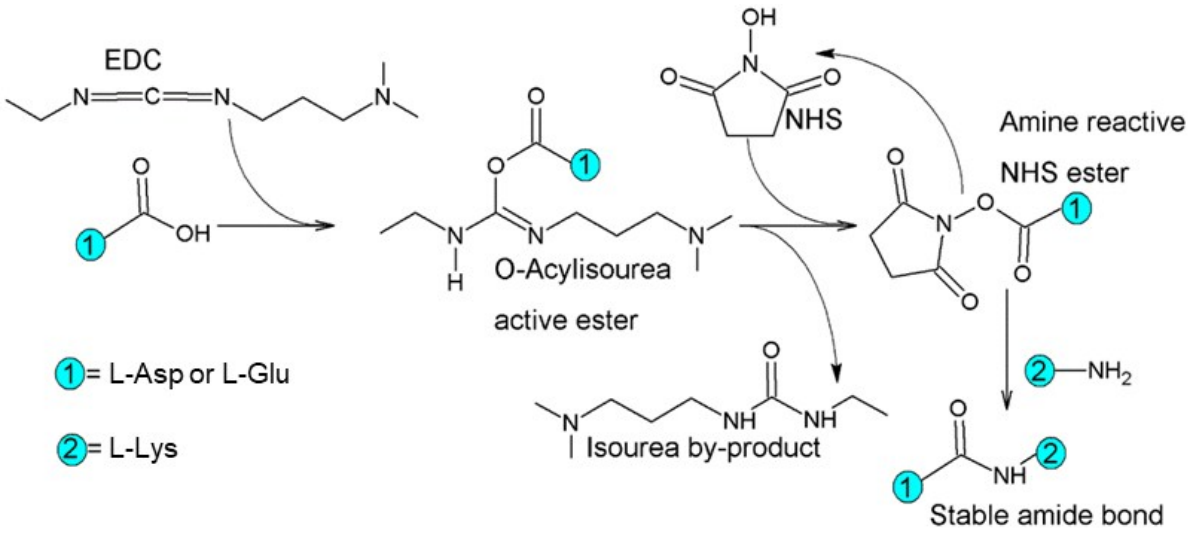

Fig.S1. Reaction scheme for the EDC/NHS-based cross-linking. First, EDC reacts with carboxylic acid groups (from GE: L-Aspartic acid and L-Glutamic acid) to form an active O-acylisourea intermediate. Addition of NHS to EDC reactions increases the efficiency and enables a molecule that is easily displaced by nucleophilic attack from primary amino groups (Lysin of GE) in the reaction mixture to give stable amide bonds.

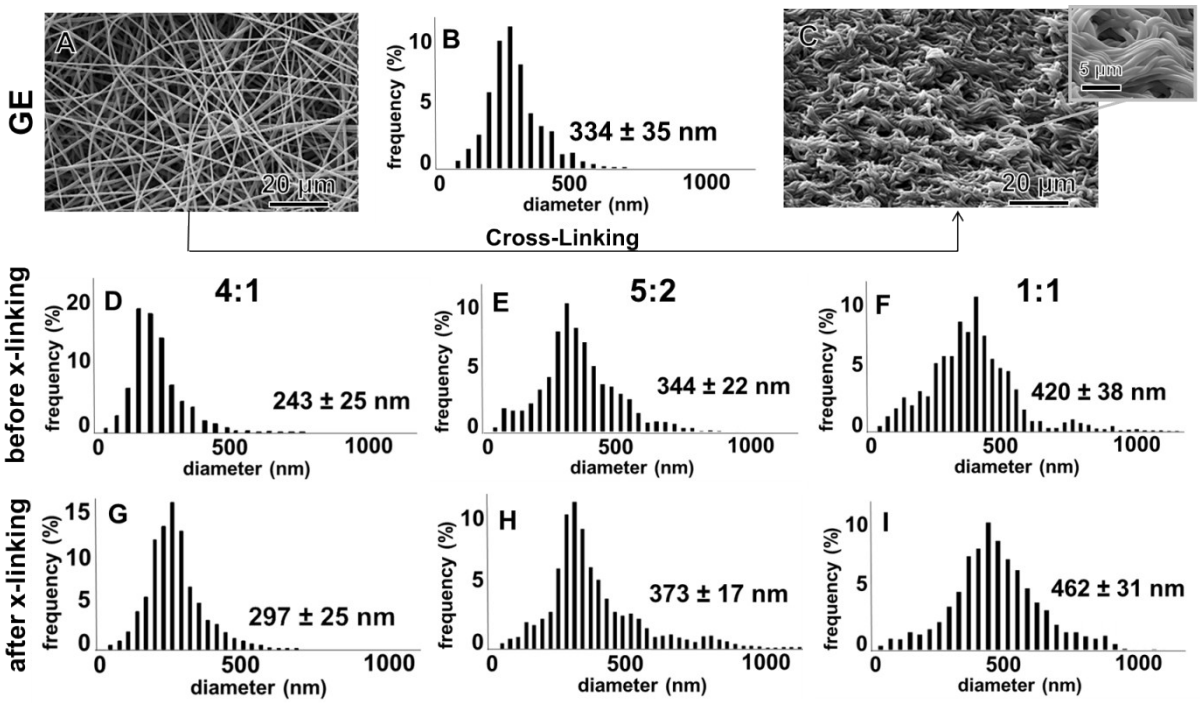

Fig.S2. A. SEM image of electrospun GE B. Corresponding fiber diameter distribution. C. SEM images at different magnifications of cross-linked electrospun GE. D-I. Fiber diameter distribution of electrospun hybrid GE:PLA scaffolds, before (D-F) and after cross-linking (G-I).

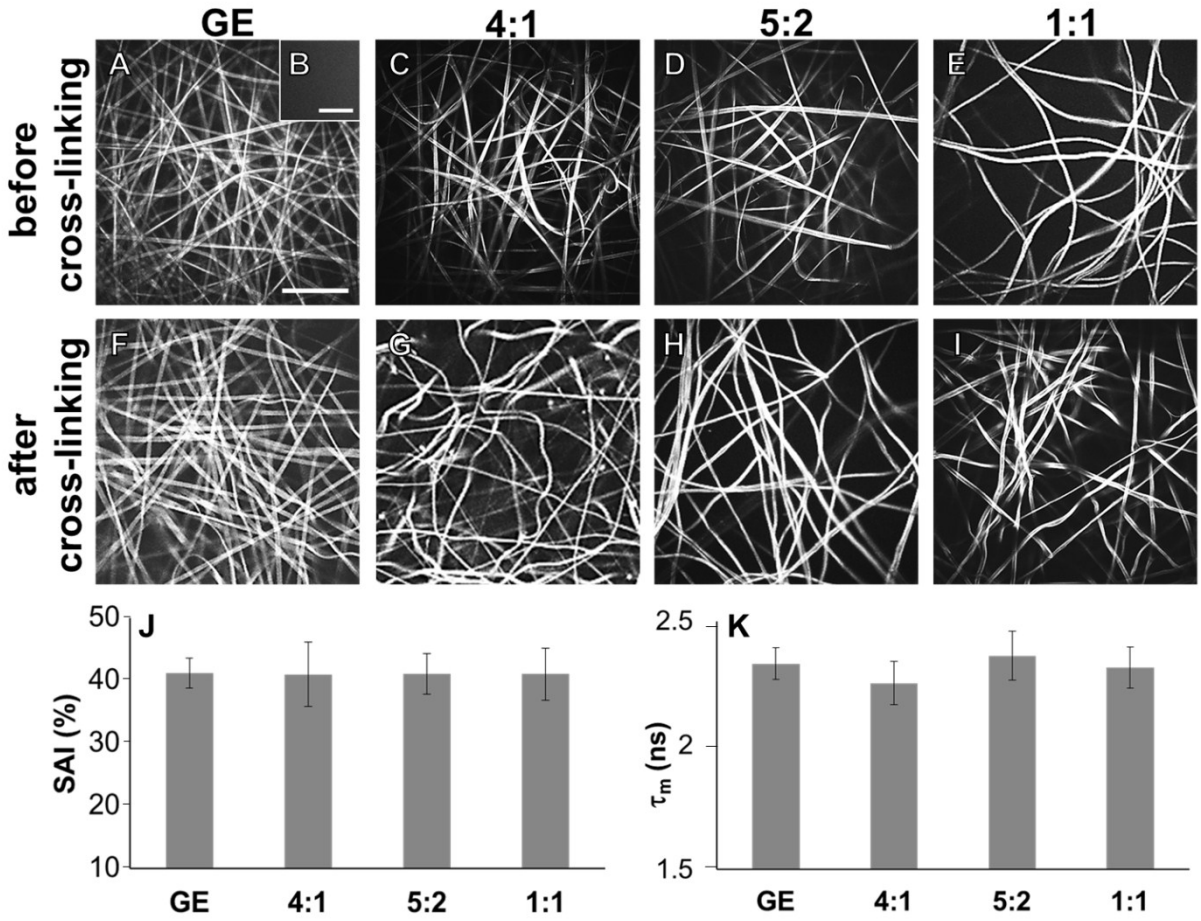

Fig.S3. A-E. AF images of electrospun: GE (A), PLA (B), GE:PLA 4:1 (C); GE:PLA 5:2 (D); GE:PLA 1:1 (E). F-I. AF images of cross-linked electrospun: GE (F), GE:PLA 4:1 (G); GE:PLA 5:2 (H); GE:PLA 1:1 (I). J. SHG to AF index (SAI) of GE-containing electrospun and crosslinked scaffolds after two-photon excitation at 760 nm. K. Mean fluorescence lifetime (τ_m) of GE-containing electrospun and crosslinked scaffolds after two-photon excitation at 710 nm. Scale bars equal 30 μm.

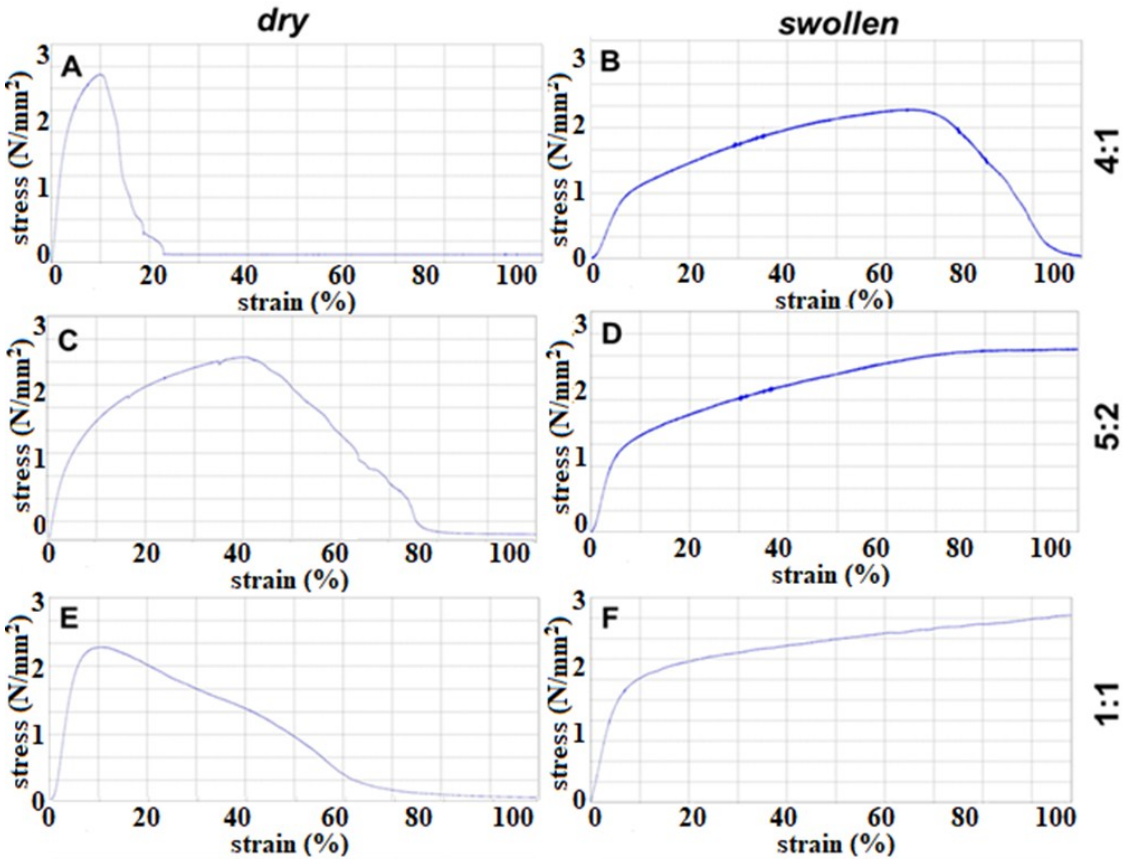

Fig.S4. A-F. Representative stress-strain curves of: GE:PLA 4:1 before (A) and after swelling (B); GE:PLA 5:2 before (C) and after swelling (D); GE:PLA 1:1 before (E) and after swelling (F)

Table S1. Values for the E-modulus of the hybrid scaffolds, in both conditions, dry and after swelling.

GE:PLA ratio	E-modulus before swelling (MPa)	E-modulus after swelling (MPa)
4:1	16.4 ± 2.4	16.2 ± 1.6
5:2	13.0 ± 1.4	12.6 ± 1.8
1:1	8.6 ± 0.8	8.8 ± 0.7

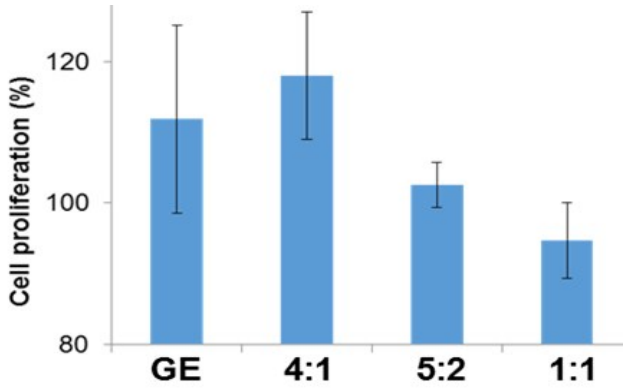

Fig.S5. Results of the MTS assay for all the hybrid cross-linked scaffolds, as well as for pure cross-linked GE. Proliferation > 80% is non-cytotoxic. The negative control (normal cell culture medium) was set 100%.