Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

SUPPORTING INFORMATION

Polycaprolactone Fibers with Self-assembled Peptide Micro/Nanotubes: a Practical Route Towards Enhanced Mechanical Strength and Drug Delivery Applications

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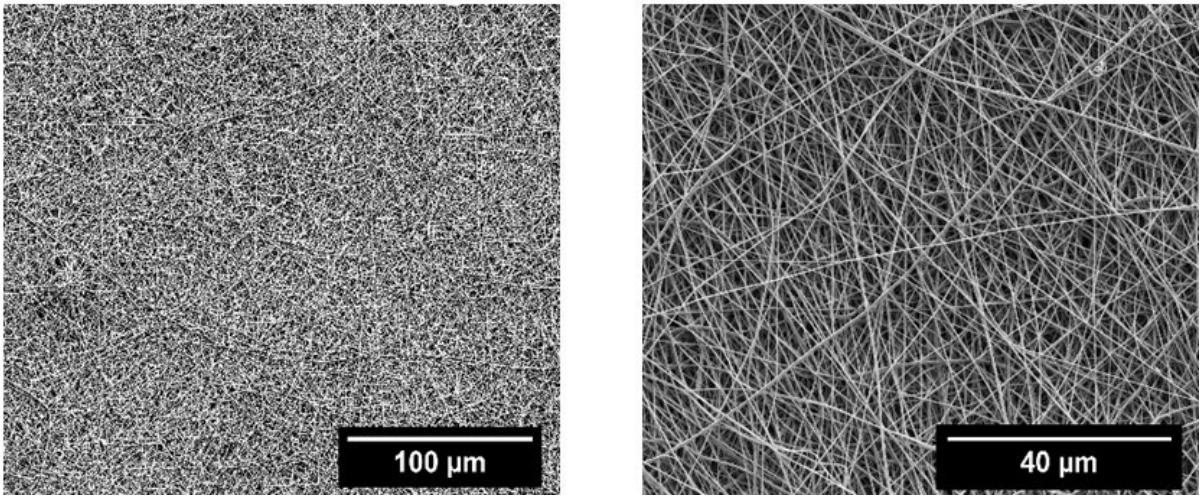


Figure S1. SEM-FEG images of 50% showing the homogeneity membranes.

Table S1. Diameters of polymer/peptide fibers. Averages and standard deviations calculated over 100 measurements.

	PCL	**2,5%**	**7,5%**	**15%**	**30%**	**50%**
Average	571,3	551,6	481,9	451,9	413,0	361,5
Standard Deviation	5,5	4,9	7,6	4,0	7,9	7,9

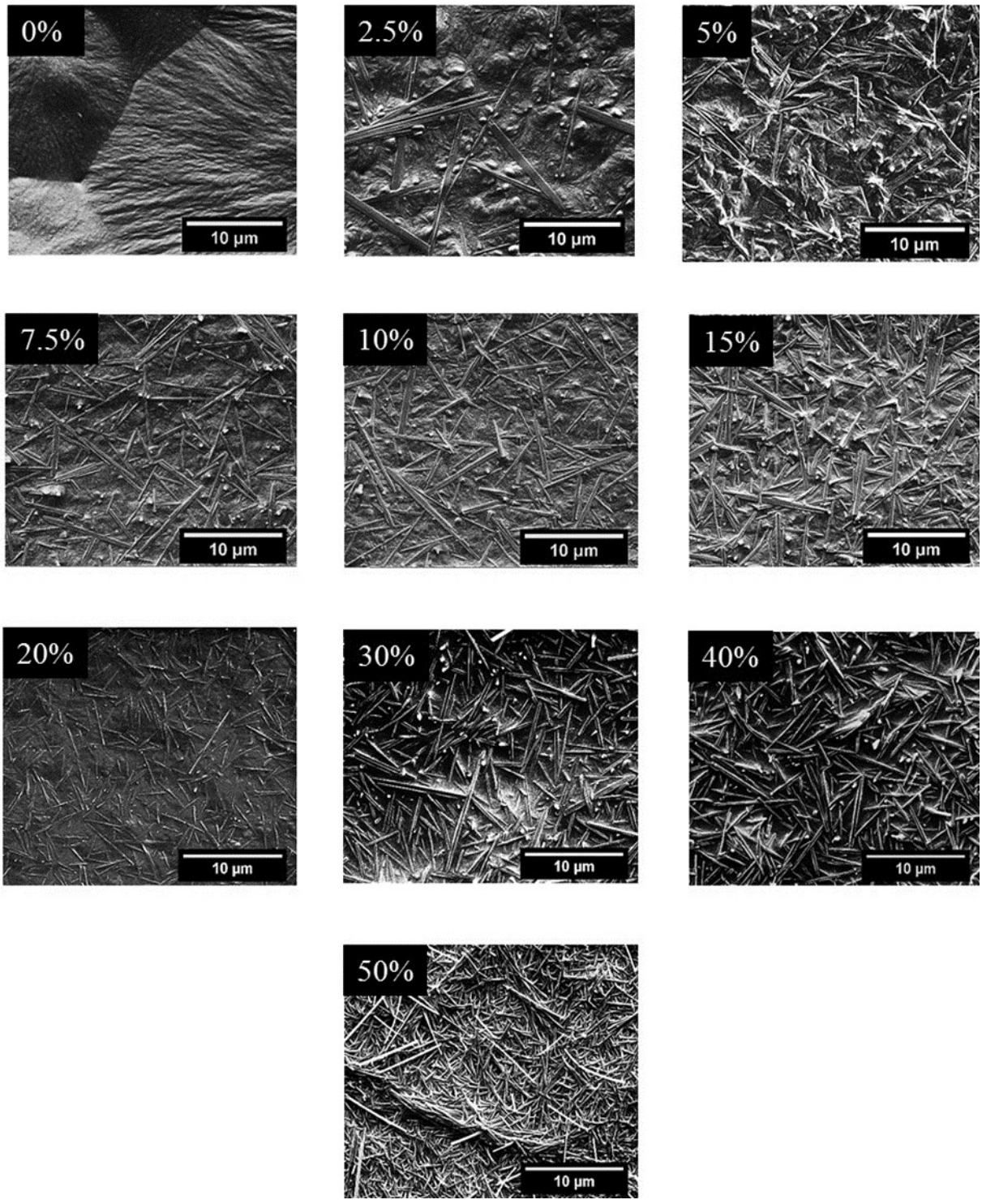


Figure S2. SEM images from samples heated at 180° C containing different FF/PCL ratios.

Table S2. Mechanical properties of pure electrospun PCL and composite scaffolds.

Samples	Stress (MPa)	Young modulus (MPa)	Elongation at break (%)
0%	2.00	12.47	104.119
2.5%	5.35	14.21	138.606
7.5%	7.45	14.91	110.547
15%	12.87	15.38	204.6838
20%	13.07	16.44	238.103
30%	14.68	17.22	294.007
40%	15.44	18.12	415.818
50%	9.92	18.96	Out of range

ENTROPY CONTRIBUTIONS

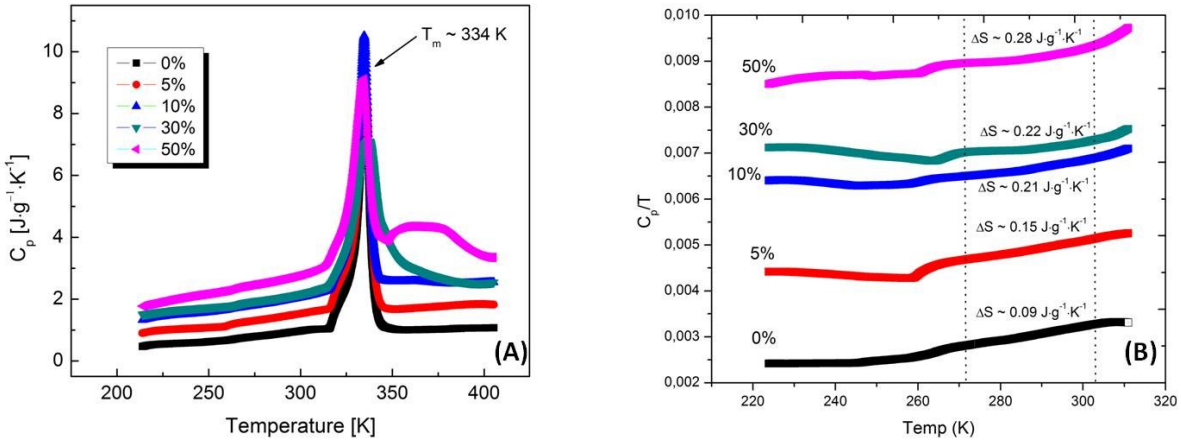


Figure S3: Plots of Cp and Cp/T as a function of temperature used for obtaining entropy changes in polymer/peptide mixtures. A remarkable increase on ΔS is observed upon addition of peptide in the polymer matrix, which is ascribed to the growth disorder in the scaffolds (see main text for details). Dotted lines in (B) delimitate a transition-free region which has been used for integration and determination of entropy changes just before melting.

Entropy contributions have been estimated from C_p curves by using the Kirchhoff's law [1,2]:

$$\Delta S = \int_{T_i}^{T_f} \frac{C_p}{T} dT \qquad Eq.S1$$

To estimate entropy gain in different samples, we have integrated *Cp/T* in the temperature range between 0°C and 30°C. This interval has been chosen due to absence of phase transitions and because it comprises typical temperature values for applications of these composite materials. Results from our calculations appear alongside with *Cp/T* curves in Figure S3B. One observes that the entropy gain on samples containing peptides, within a temperature interval just previous to phase transition, increases by a factor ~3 in formulations with 50% FF/PCL in comparison with pristine PCL.

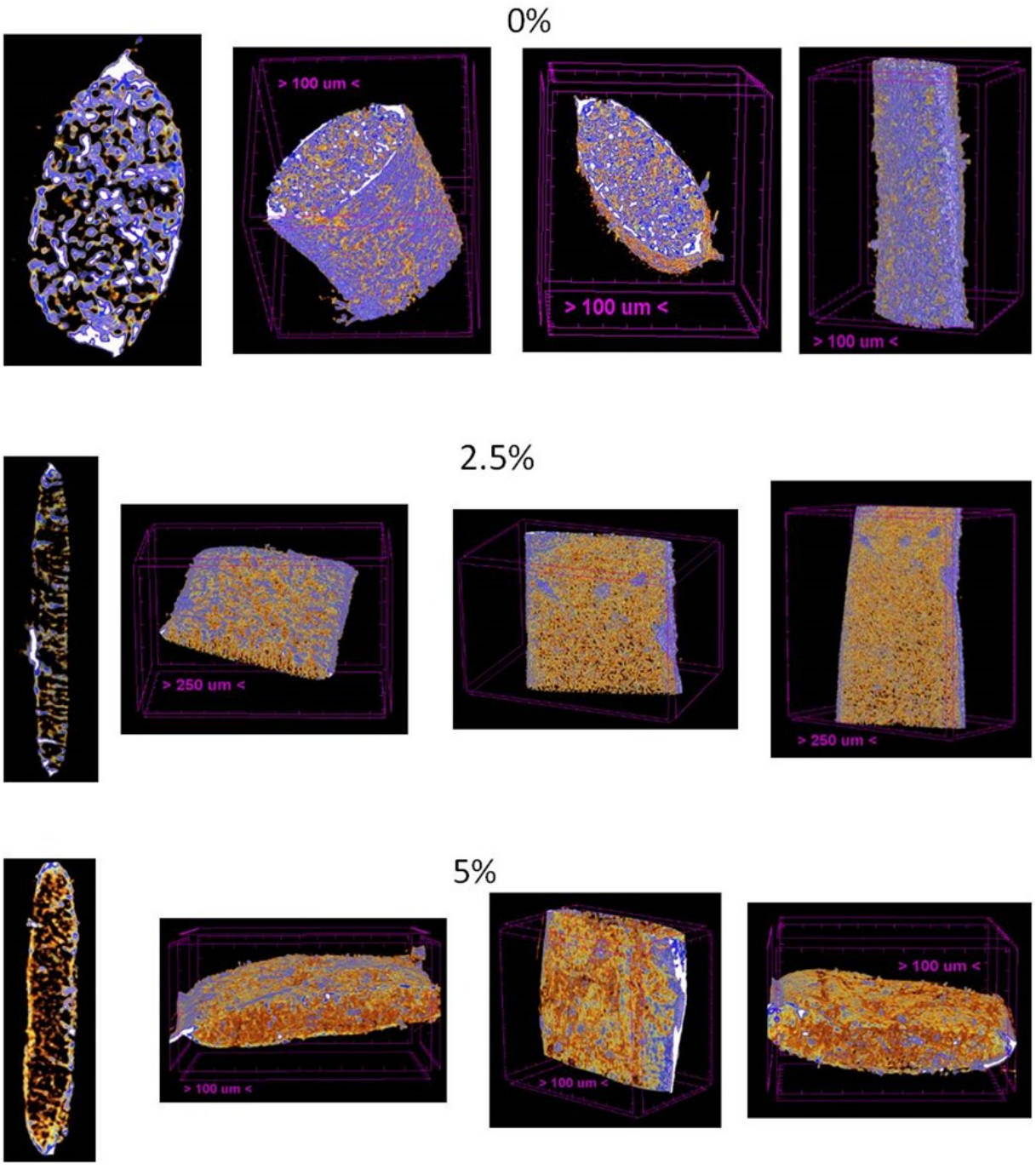
Entropies of fusion have been estimated considering that, at T_m, ΔG_m is given by [2-4]:

$$\Delta G_m = \Delta H_m - T_m \Delta S_m = 0$$

This leads straightforward to the relationship:

$$\Delta S_m = \frac{\Delta H_m}{T_m} \qquad Eq.S2$$

MICROTOMOGRAPHY IMAGES



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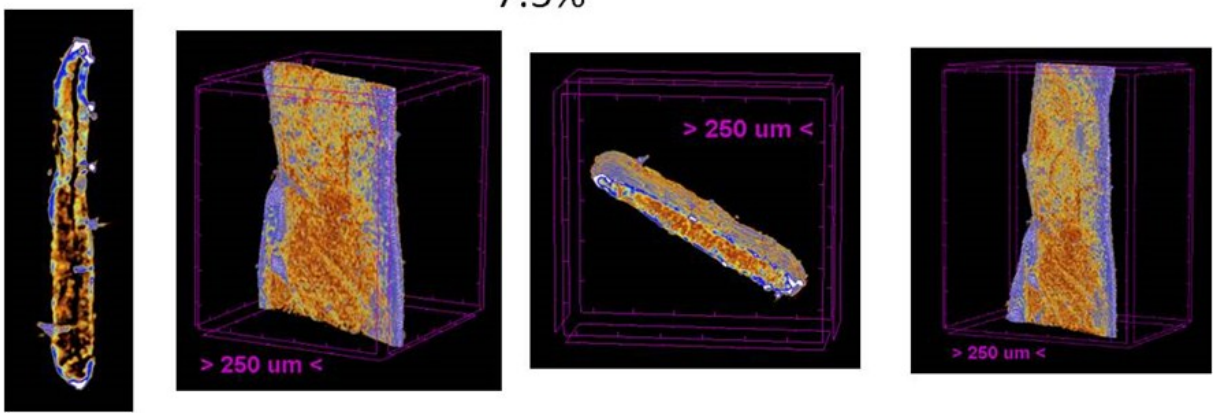

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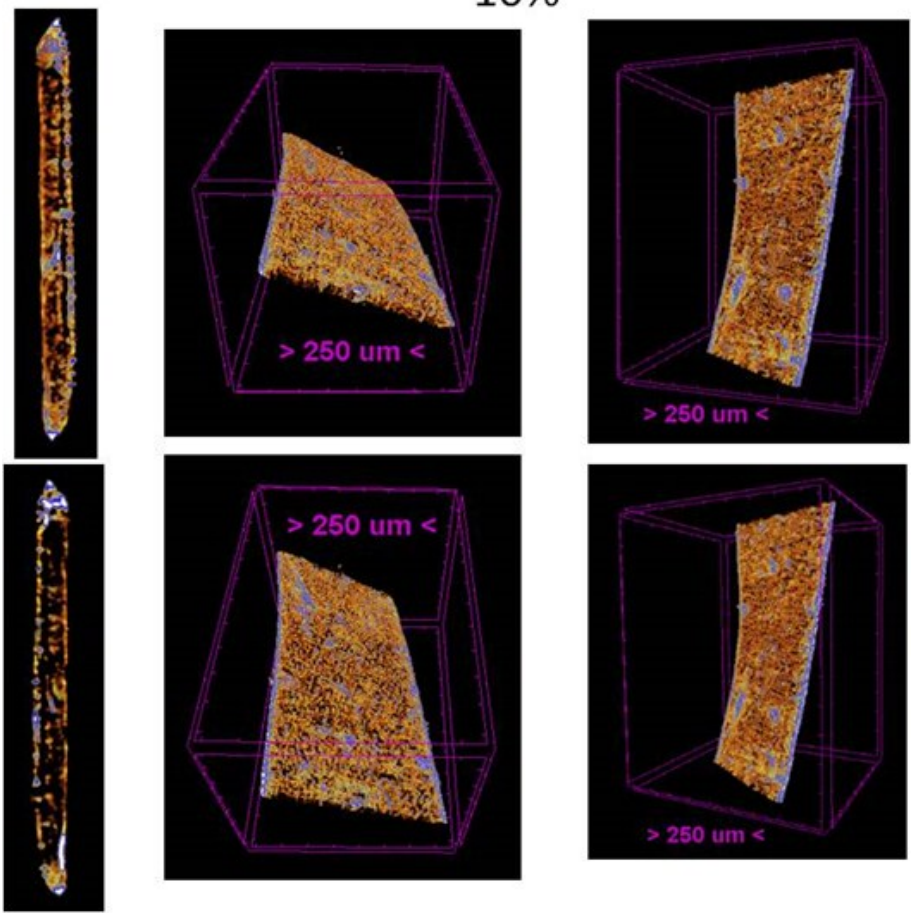

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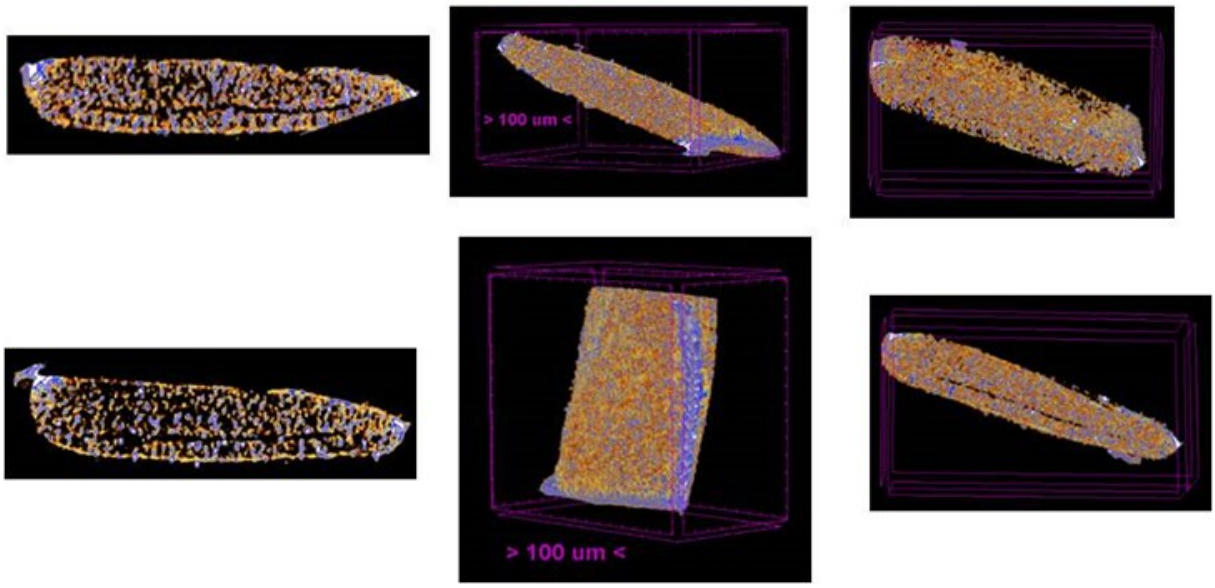

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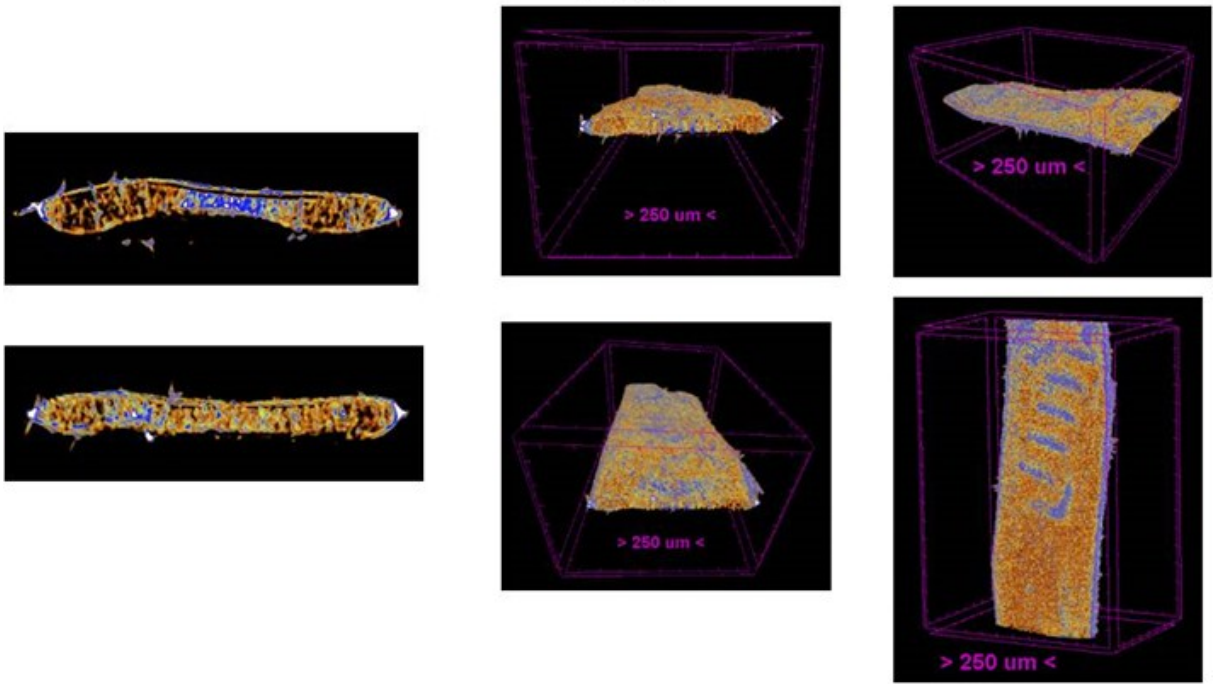

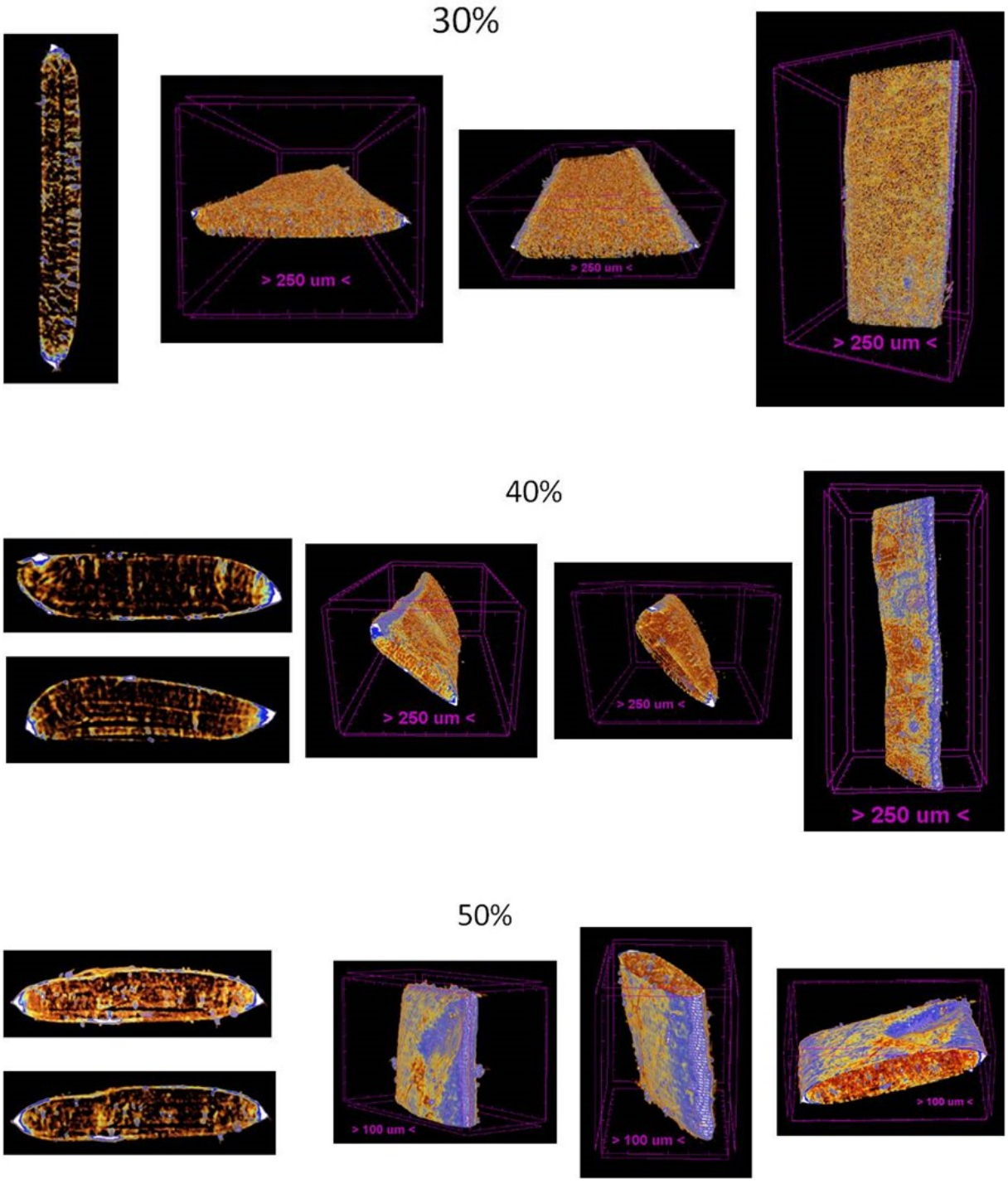

Figure S4. Micro-CT images showing different perspectives from FF-MNTs/PCL membranes.

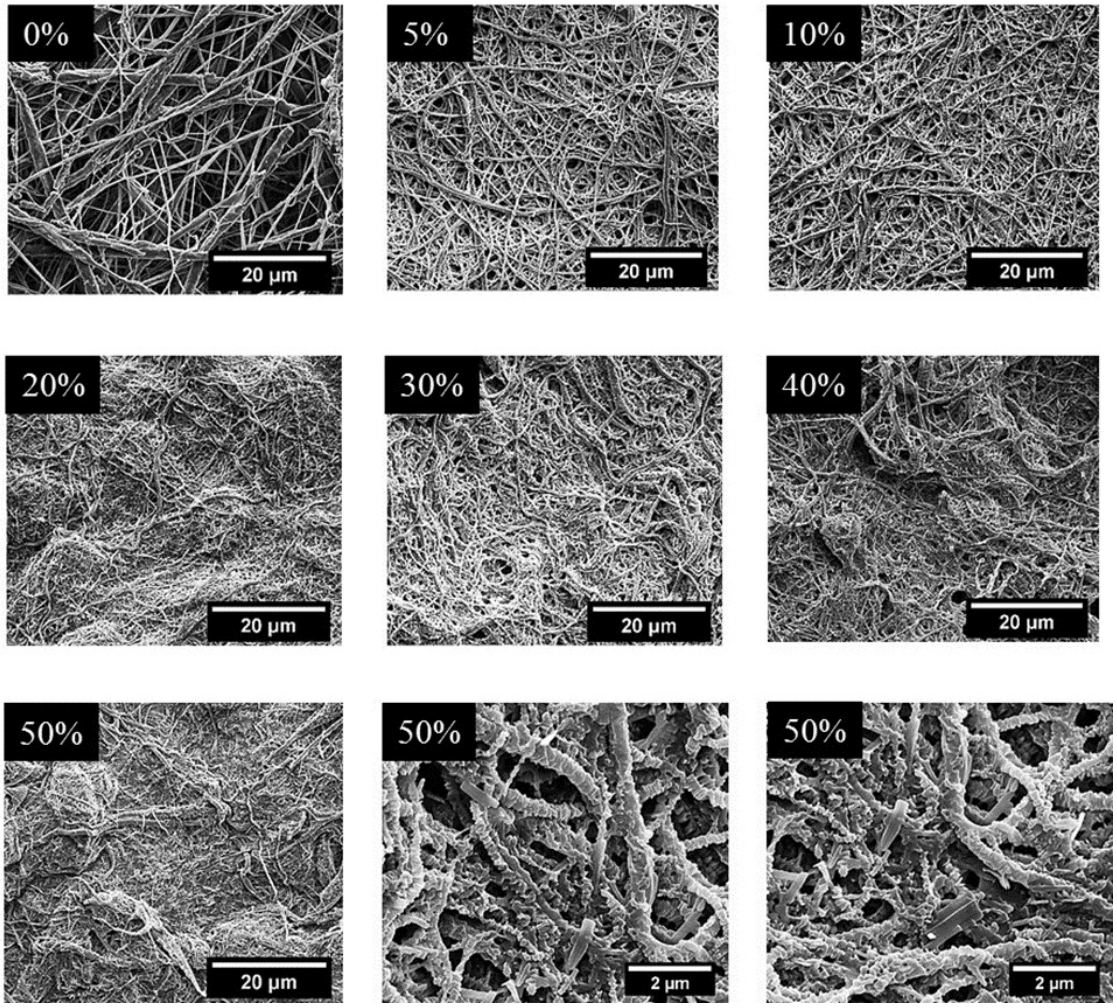

Figure S5. FEG-SEM images from biodegraded samples.

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