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

Mixed polymer and bioconjugate core/shell electrospun fibres for biphasic protein release

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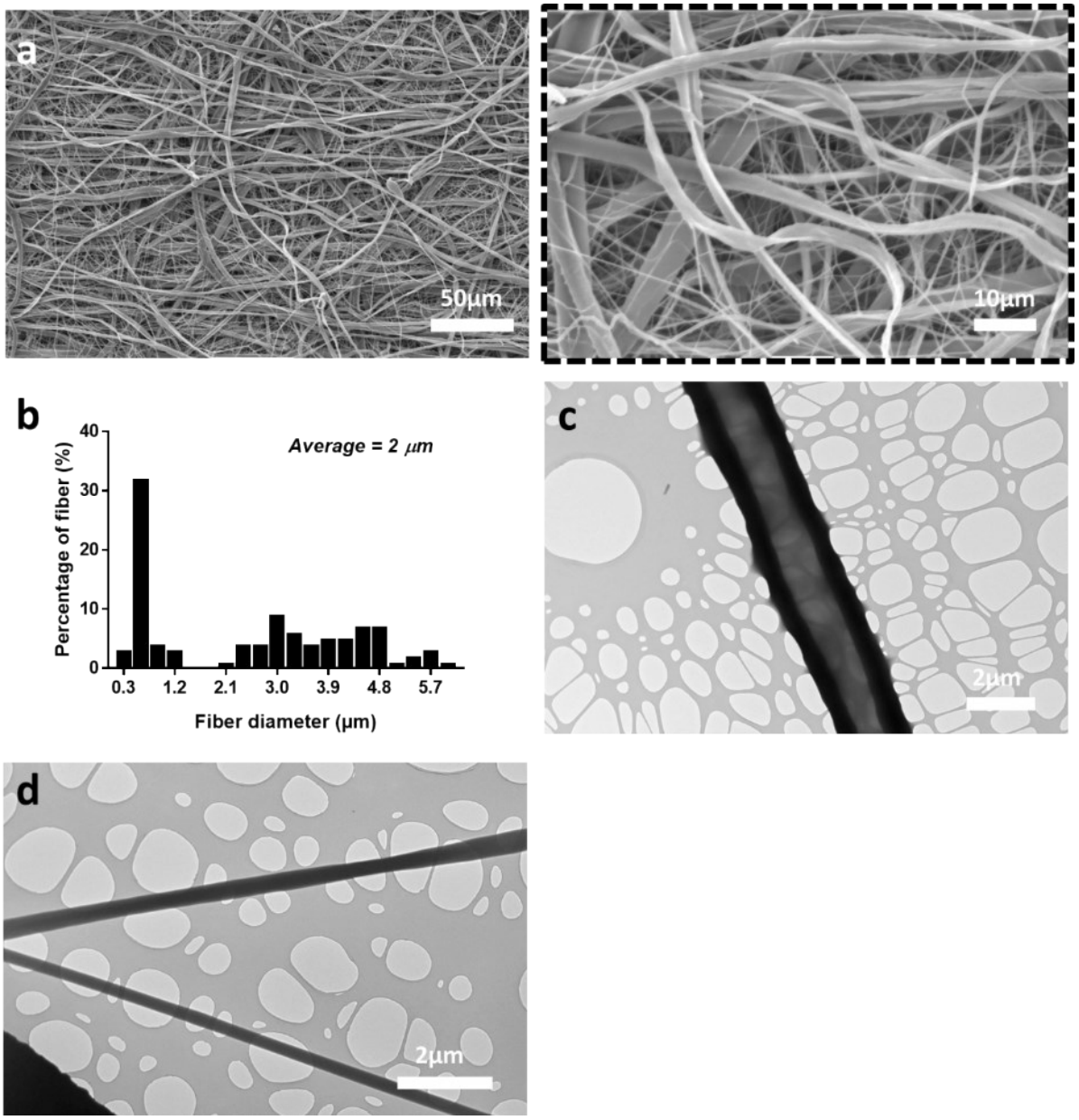
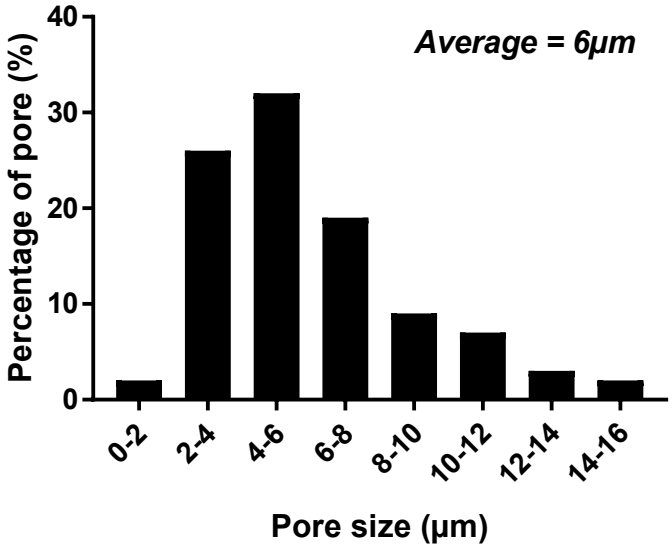
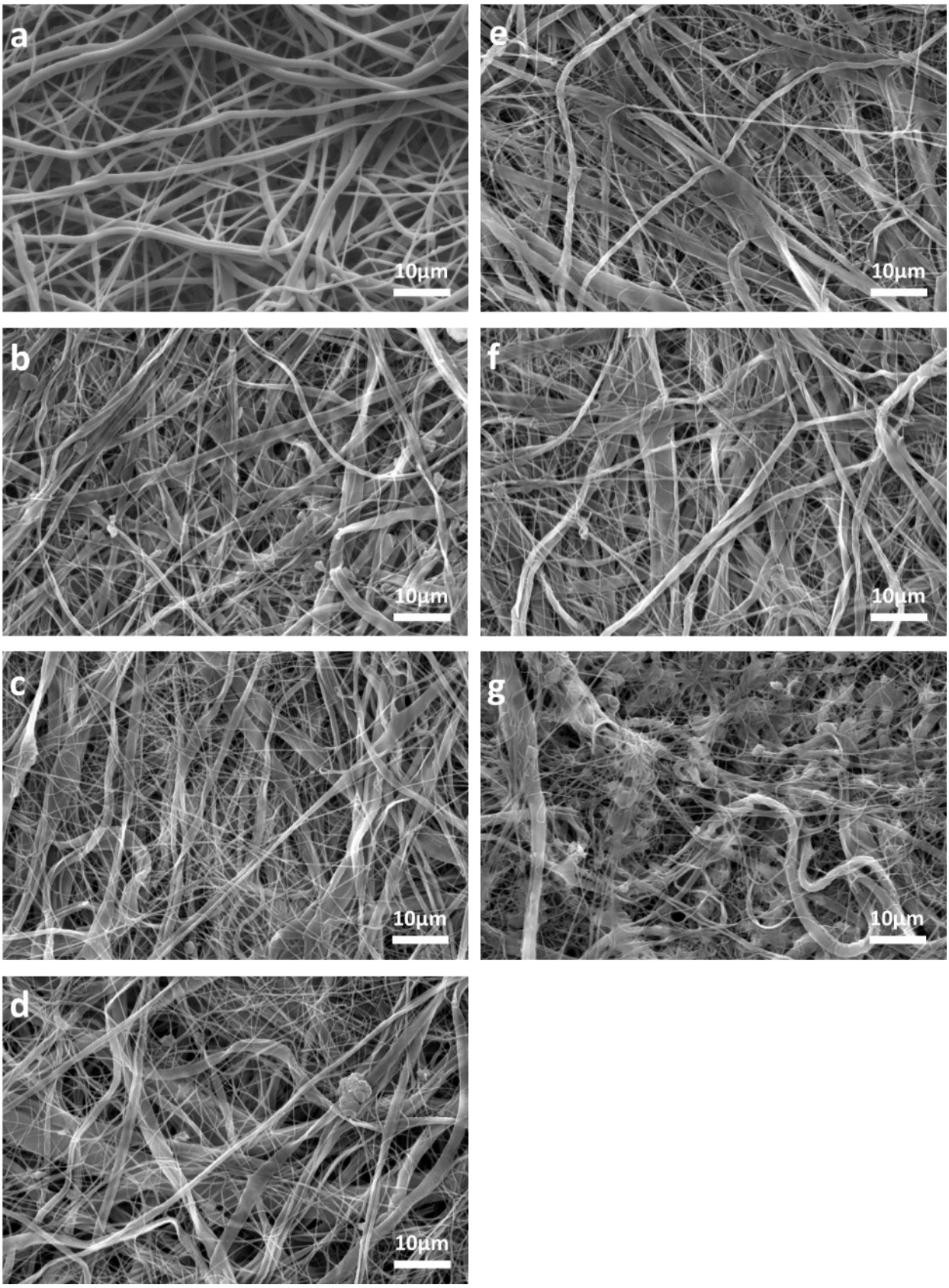


Supplementary figure 1: Morphology characterisation of PEO/PCL scaffold with PEO 400kDa including low and high magnification SEM images (a), the histogram of the fibre diameter distribution calculated from 100 measurements based upon five different SEM images (b) and of individual fibre morphology and structure using TEM (c). TEM image of PEO/PCL scaffold with PEO 900kDa is shown in (d) illustrating loss of the core/shell structure.

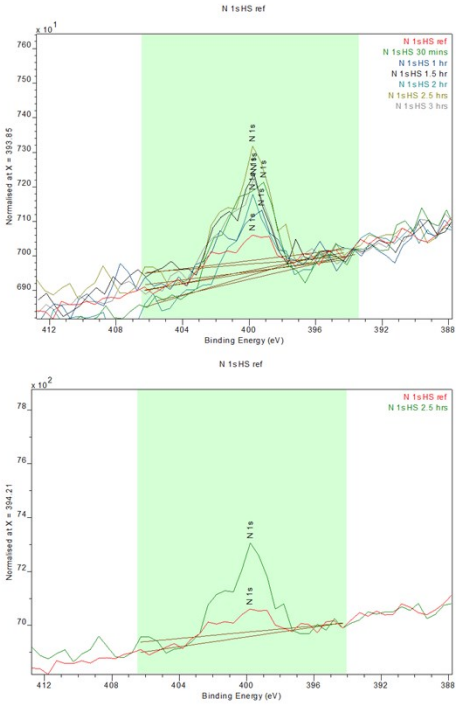


Supplementary figure 2: Histogram of PEO/PCL/JFA scaffold pore size distribution obtained from SEM images after cryosection of the scaffolds. The histograms were calculated from 100 measurements on Image J 1.52h software (from the ImageJ package Fiji) based upon five different SEM images.



Supplementary figure 3: SEM image of PEO/ PCL scaffolds before (a) and after aminolysis treatments of 30min (b), 1h (c), 1h30 (d), 2h (e), 2h30 (f), 3h (g).

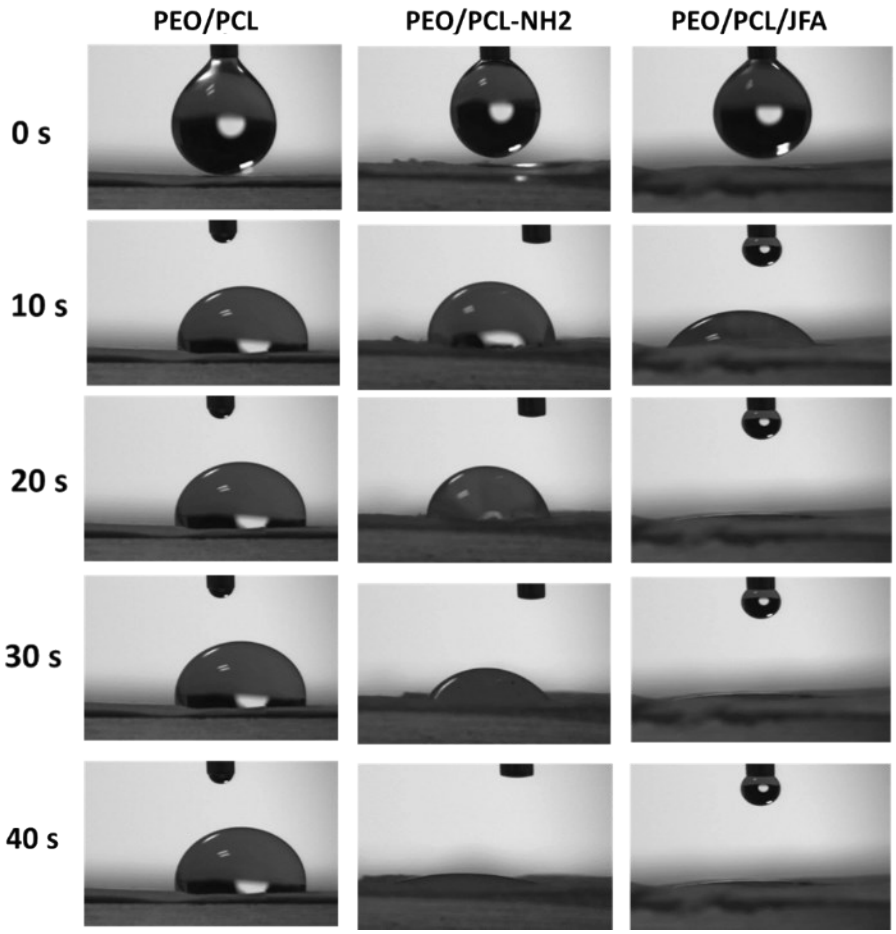
a



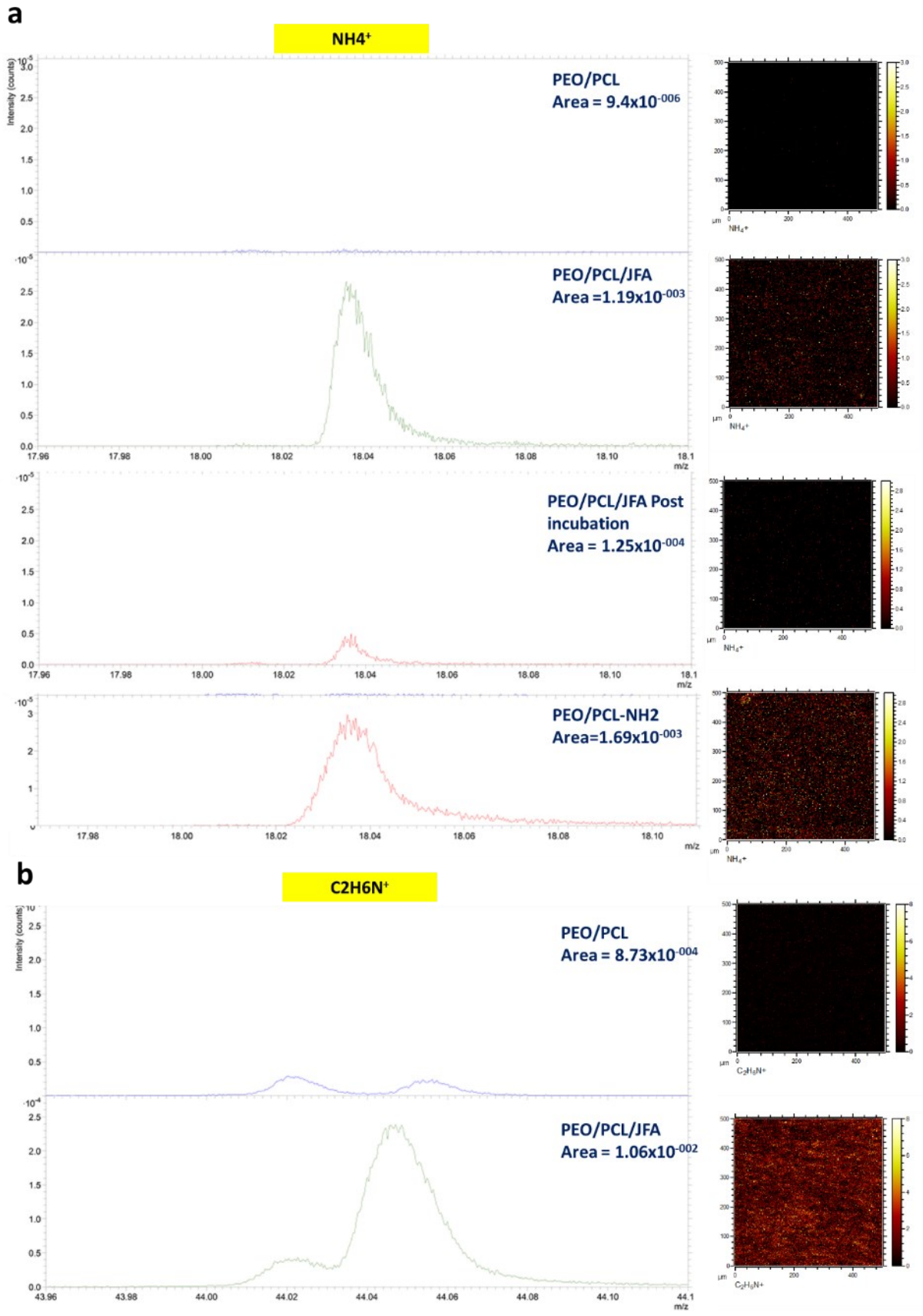
b

Aminolysis treatment time	C 1s %	N 1s %	O 1s %
Reference - Omin	79.535	0.12	20.34
30mins	78.245	0.25	21.505
1hr	78.845	0.18	21.01
1.5hr	79.285	0.22	20.495
2hr	78.985	0.27	20.81
2.5hr	78.445	0.215	21.34
3hr	79.015	0.26	20.775

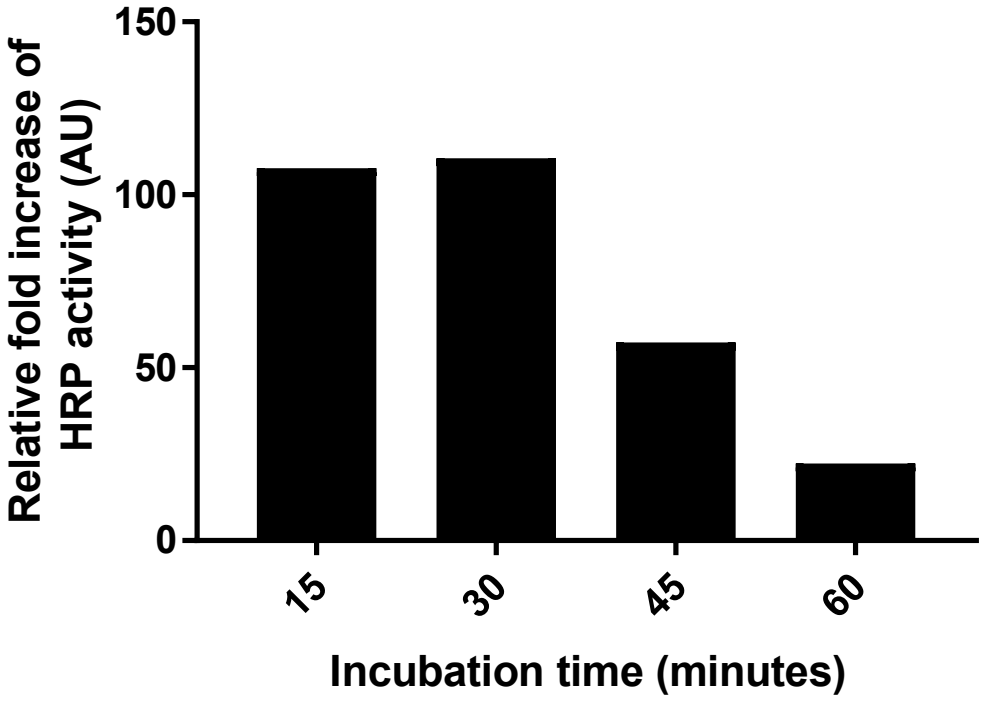
Supplementary figure 4: XPS detection of nitrogen on PEO/PCL scaffolds post aminolysis treatment (30min, 1h, 1h30, 2h, 2h30, 3h) including the graphs (a) and a table of the atomic percentage of carbon, oxygen and nitrogen based on the peak intensities (b).



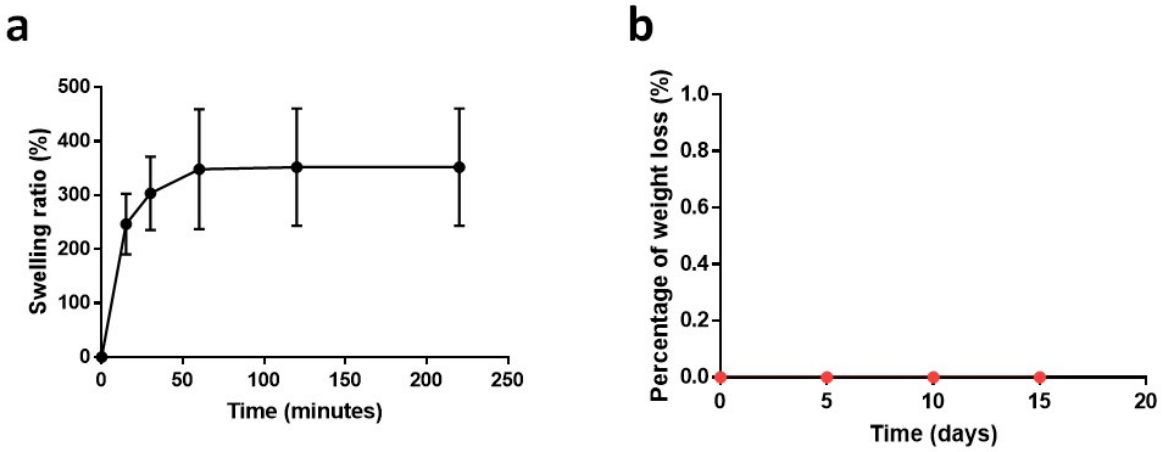
Supplementary figure 5: Images of water contact angle (WCA) measurement for PEO/PCL, aminolyzed PEO/PCL and PEO/PCL/JFA scaffolds.



Supplementary figure 6: TOF-SIMS detection of $NH4^+$ (a) and $C2H6N^+$ (b) for PEO/PCL, aminolyzed PEO/PCL, PEO/PCL/JFA and PEO/PCL/JFA scaffolds post incubation in water (37°C for 7 days). Peak area normalized to the ion intensity as well as ion map are shown for each condition.



Supplementary figure 7: TMB assay showing HRP_{SM} adsorption for increasing periods of time 15min, 30min, 45min and 60min on PEO/PCL-NH_2 scaffolds. HRP_{SM} was conjugated onto the PEO/PCL-NH_2 scaffold surface by first placing 10mm diameter scaffolds in an HRP solution (50 ng/mL) for 30min at 37 °C in a shaking incubator. The scaffolds were then placed in PBS in a shaking incubator at 37 °C , for a period of 15min, 30min, 45min and 60min. HRP_{SM} activity was assessed by placing the scaffold in 3,3′,5,5′-Tetramethylbenzidine substrate solution (TMB) for 15min. TMB colour intensity on the scaffold surface was quantified by Image J. All samples were normalized to the control (PEO/PCL-NH_2 blank scaffold, no HRP conjugation).



Supplementary figure 8: (a)Swelling ratio of PEO/PCL/JFA scaffold over a period of 240 hours (n=4) (b) Degradation profile by percentage of weight loss analysis of PEO/PCL/JFA scaffold over a period of 15 days (n=4)