Electronic Supplementary Material (ESI) for Analyst.

Simple fluorinated moiety insertion on Aβ 16–23 peptide for stain-free TEM imaging

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S.1 Peptide characterisations

S.1.1 Aβ 16–23

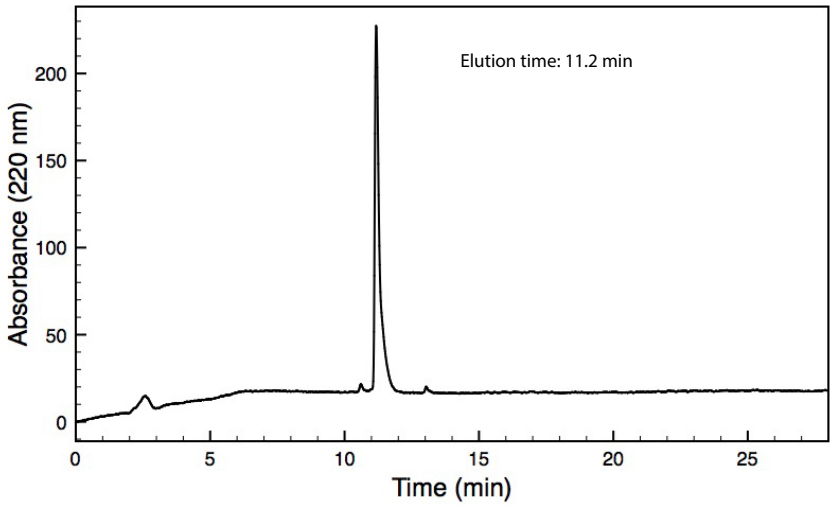

Figure S1: Analytical HPLC of purified Aβ 16–23 peptide.

ESI: $(M+H)^{2+}$: 484.50, $(M+H)^{+}$: 967.63; MALDI: $(M+H)^{+}$: 966.97 (Exact MW: 967.14)

S.1.2 F–Aβ 16–23

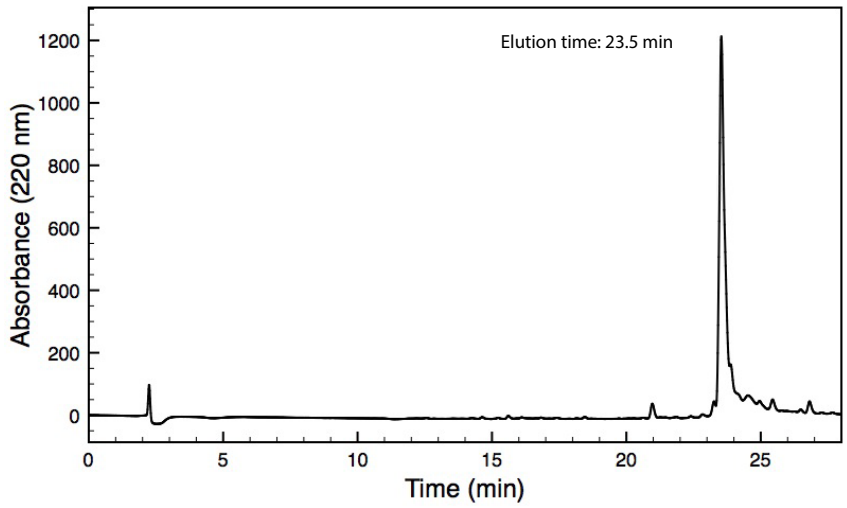

Figure S2: Analytical HPLC of purified F–Aβ 16–23 peptide.

ESI: $(M+H)^+$: 1207.43; MALDI: $(M+H)^+$: 1206.89 (Exact MW: 1206.23)
^{19}F–NMR: -61.5 ppm (CF_3-Ar), -74 ppm (CF_3COOH)

S.2 Molar extinction coefficient (ε) and concentration calculations by UV–Vis

Prior to each experiment the concentration of the peptides was carefully measured by UV-Vis spectroscopy. The 3,5–bis(trifluoromethyl)benzoic acid (F) has a strong maximum absorbance (λ_{max}) around 280 nm, which makes the contribution of Phe at that wavelength negligible. On this basis we experimentally calculated, using five solutions at different concentrations in F, the molar extinction coefficient ε at 280 nm for the fluorinated moiety. Plotting [F] *vs.* absorbance we found an ε_{280} of 6.9 mM^{-1} cm^{-1}, which has been applied to F–Aβ 16–23 peptide to measure its concentration.(Figure S3)

The Aβ 16–23 peptide is low in strongly absorbing residues, therefore the use of the ε_{214} was preferred over ε_{280}. The coefficient was calculated following the instructions of Gruppen's paper.[1]

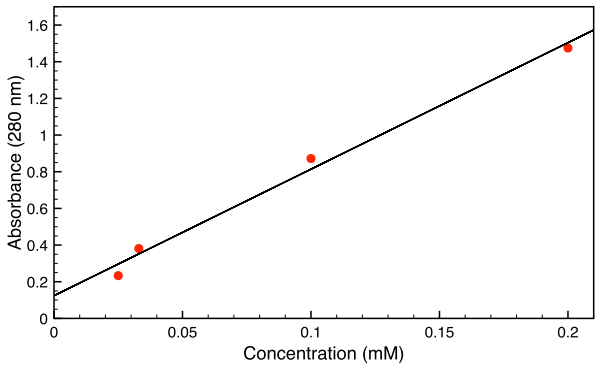

Figure S3: Experimental data to calculate F–Aβ 16–23 peptide molar extinction coefficient.

S.3 Transmission electron spectroscopy (TEM) additional images

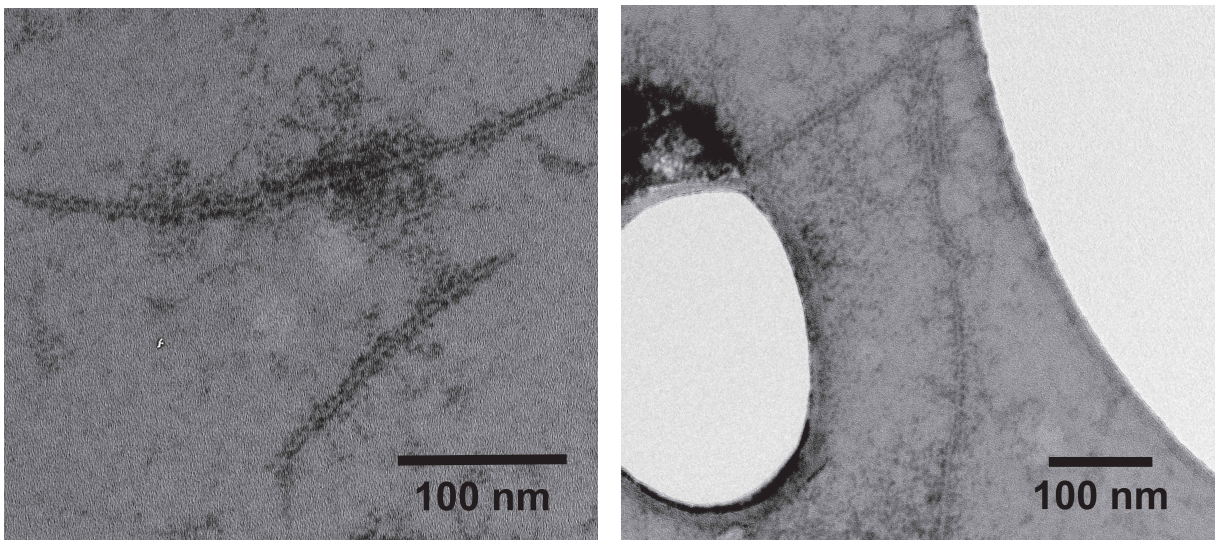

Figure S4: TEM images of Aβ 16–23 fibres after 2 weeks of incubation at 37 °C, the peptide was stained with uranyl acetate 2% solution in water.

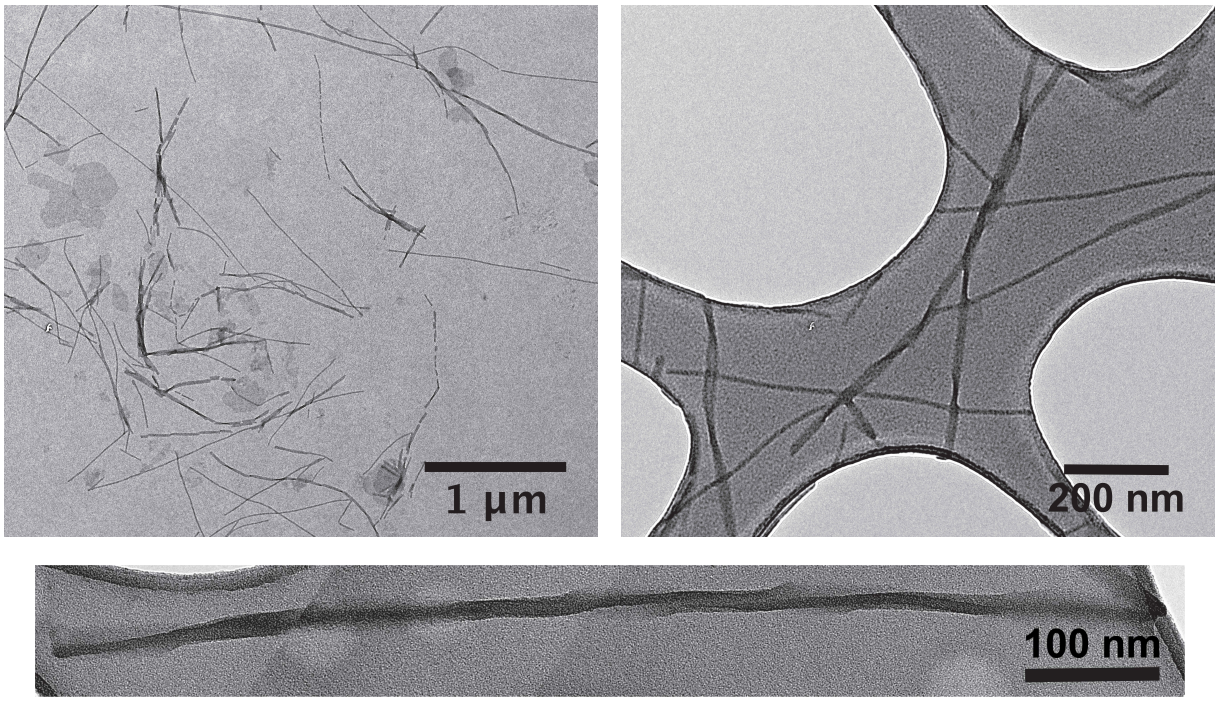

Figure S5: TEM images of *F*–Aβ 16–23 fibres imaged after 2 weeks of incubation at 37 °C, no staining was applied.

S.4 Atomic and Electrostatic Force Microscopy (AFM and EFM) additional images

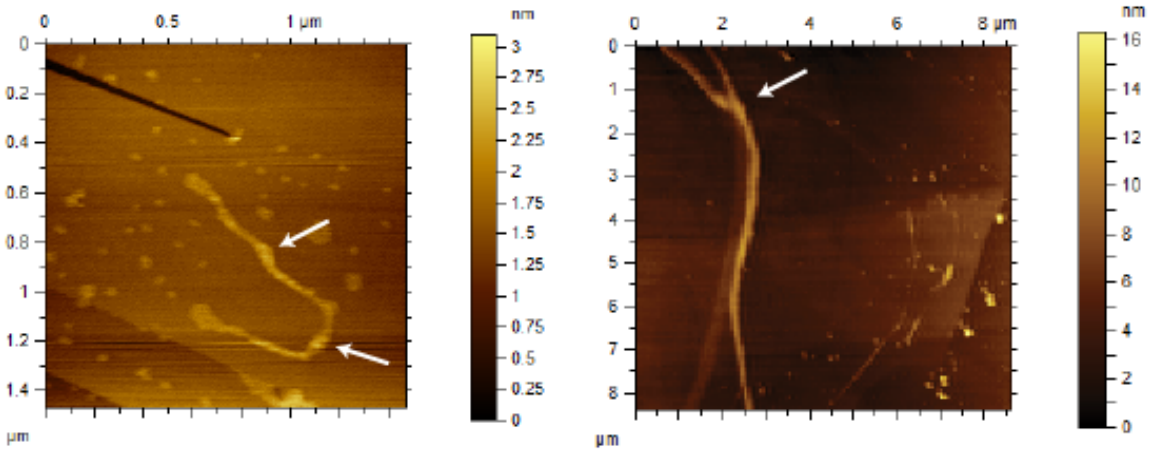

Figure S6: Topography of Aβ 16–23 l(eft) and *F*–Aβ 16–23 (right) fibres. The cross–over points are highlighted by white arrows in both of the images.

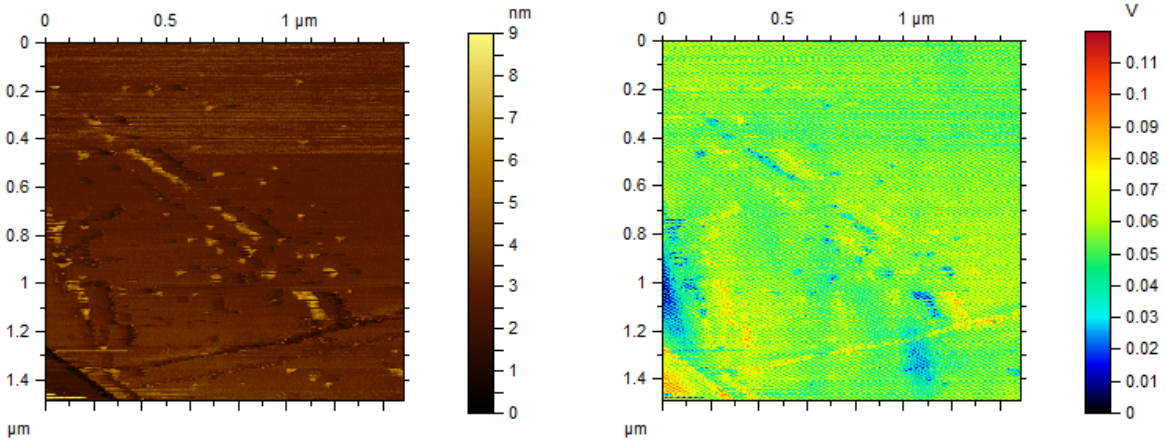

Figure S7: Topography and respective electrostatic force map of Aβ 16–23 fibres after 2 weeks of incubation at 37 °C, the peptide was diluted 100–fold in ultrapure water and cast o Au–coated Si wafer.

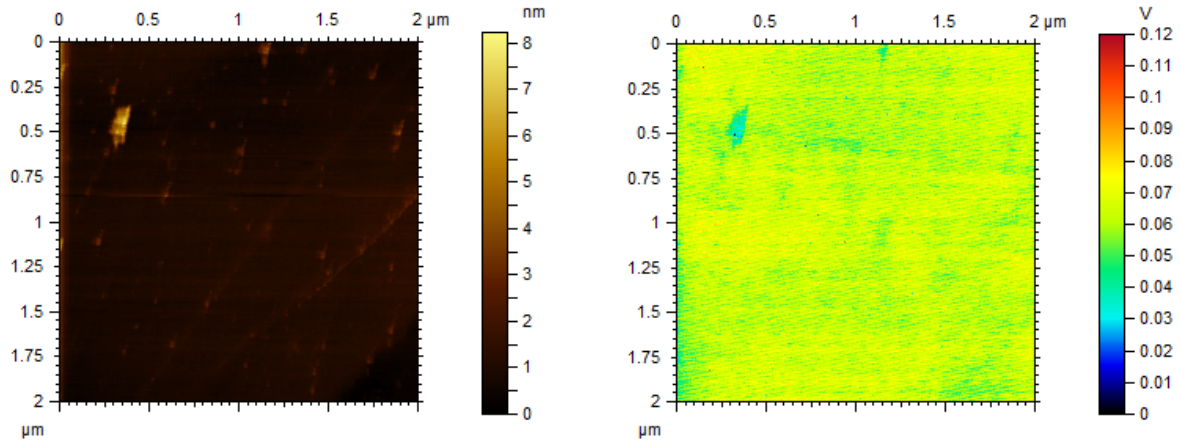

Figure S8: Topography and respective electrostatic force map of F–Aβ 16–23 fibres after 2 weeks of incubation at 37 °C, the peptide was diluted 100–fold in ultrapure water and cast o Au–coated Si wafer.

References

[1] B. J. Kuipers and H. Gruppen, *J. Agric. Food Chem.*, 2007, **55**, 5445–5451.