

Supporting Information

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SI Text

STM Experimental Details. The STM experiments have been reproduced independently after changing the solvents (acetonitrile, Milli-Q water, and ethanol), peptide concentration (the final concentration ca. 1 mg/mL, 0.1 mg/mL), and the solvent evaporation temperature (at room temperature, and heated sample at 60 °C). The specific features of peptide strands in the STM images did have certain variability which is typical for STM tip fluctuations in combination with the molecular conformational fluctuations. The results on length distribution remained nearly the same at the different sample preparation conditions.

Statistical Methods. The lengths of the peptide strands in STM images are measured by using the Nanoscope software (Veeco). A length increment of 0.325 nm for every residue is assumed in the statistical histogram of the length distribution of peptide assemblies. The measured lengths in the histograms represent 300 measured values from the independent experiments. The number frequencies in the statistical results are all based on number of events. The assignments of most probable sites are determined from the peak distribution of peptide length histograms.

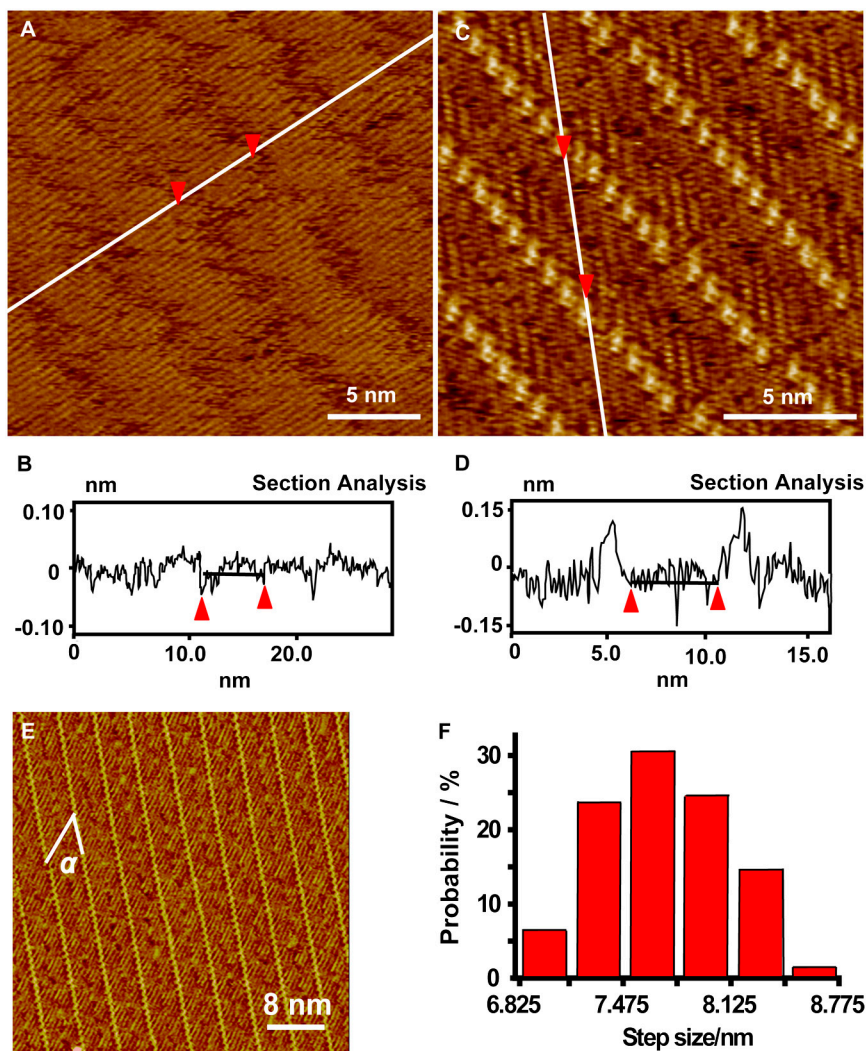


Fig. S1. The identification of hIAPP₈₋₃₇ peptide length in STM image. (A and C) The STM images of hIAPP₈₋₃₇ assembly (A) and the coassembly of hIAPP₈₋₃₇ and 4Bpy (C). The white line marks the length measurements of hIAPP₈₋₃₇ lamellae. Tunneling conditions: (A) $I = 350.0$ pA, $V = 490.0$ mV; (C) $I = 314.3$ pA, $V = 605.2$ mV. (B and D) Cross-sectional profiles corresponding to the white lines in A and C. The thick solid lines represent the averaged heights of the peptide strands, and the length measurements for the peptide strand are defined as the full widths at half averaged heights of the peptide strands. (E and F) The length distribution of hIAPP₈₋₃₇ with longer strands identified by STM. (E) The STM image of the coassembly of hIAPP₈₋₃₇ and 4Bpy. The angle α between hIAPP₈₋₃₇ molecular axes and the stripe direction is measured to be $34 \pm 2^\circ$. Tunneling conditions: $I = 555.7$ pA, $V = 668.5$ mV. (F) The length distribution histogram of the core structures of hIAPP₈₋₃₇. The average length is measured to be 7.7 ± 0.6 nm. The step size of the chart is 0.325 nm, which is equivalent to the separation of two neighboring residues in the parallel beta-sheet structure.

