Supplementary Material (ESI) for Chemical Communications

Blunt-Ended DNA Stacking Interactions in a 3-Helix Motif

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Experimental Section:

DNA strand sequences have been designed by using the program SEQUIN.[1] Biotin-modified oligonucleotides were synthesized on an Applied Biosystems 394 synthesizer, and other strands were purchased from Integrated DNA Technologies, Inc. (www.idtDNA.com); all DNA strands were purified by denaturing PAGE, eluted in a solution containing 500 mM ammonium acetate, 10 mM magnesium acetate, and 2 mM EDTA from gel, and precipitated by ethanol. Hydrogen bonded complexes were formed as described previously at a DNA concentration of 0.5 μM,[3] complexes were analyzed on non-denaturing gels.[3] Atomic force microscopy was performed as described in ref 2 for Figure 3; ref 3 for Figure 4. DNA BTX arrays containing biotinylated oligonucleotides were annealed as described[3] above; the DNA complex: streptavidin ratio was 1:1. After adding streptavidin to the annealed DNA linear array, the solution was incubated overnight at 4°C before imaging.

References:

1 N. C. Seeman, *J. Biomol. Str. & Dyns.*, 1990, **8**, 573.
2 A. Kuzuya, R. Wang, R. Sha and N. C. Seeman, *Nano Letters*, 2007, **7**, 1757.
3 R. Wang, W. Liu and N. C. Seeman, *Chemistry and Biology*, 2009, **16**, 862.

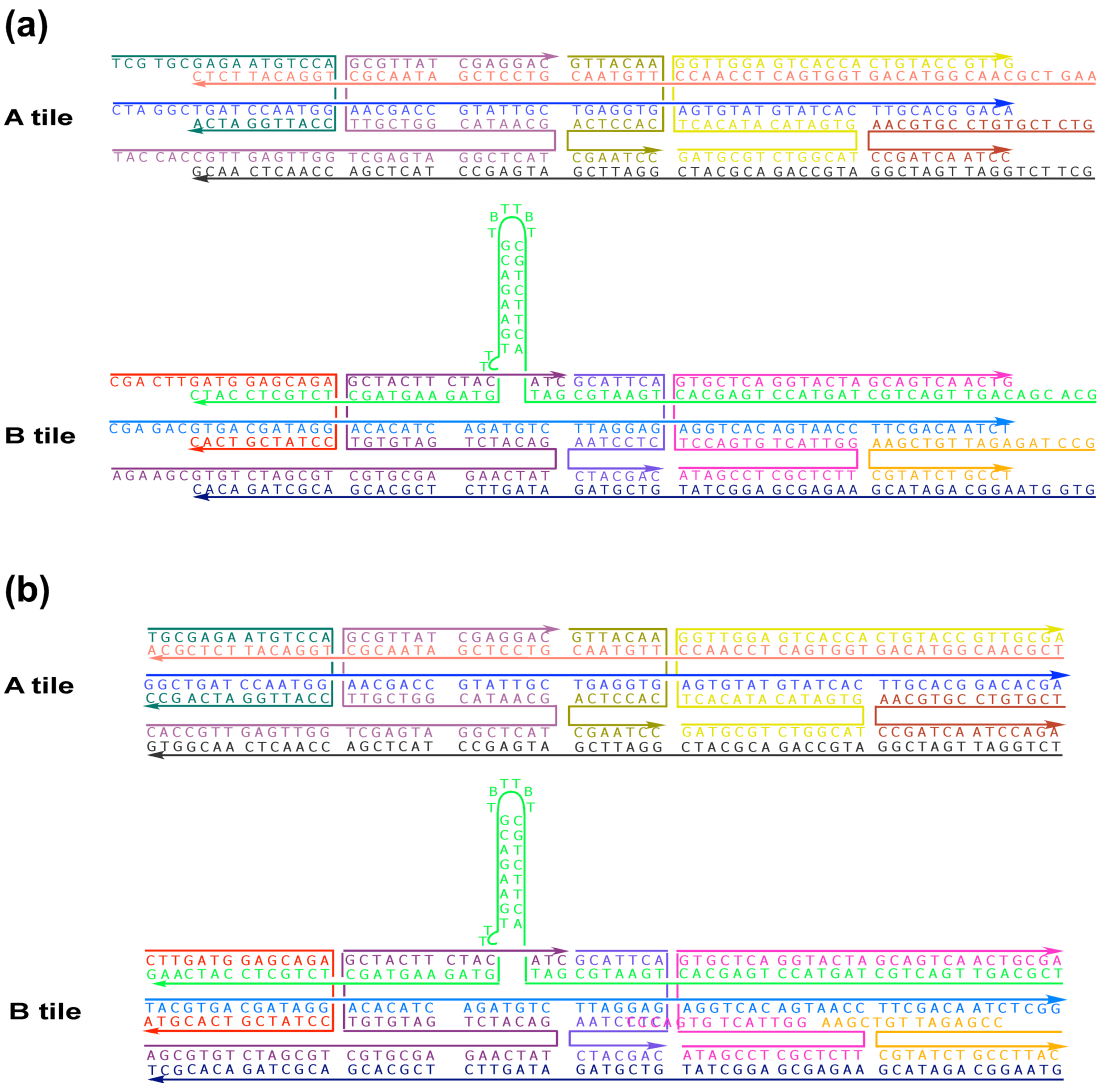

Figure S1. *The sequences of the DNA BTX molecules used in this work*. (a) shows the sticky-ended version, and (b) show the blunt-ended version The strands are color-coded to match those in Figure1. The B's in the loops represent biotin groups.

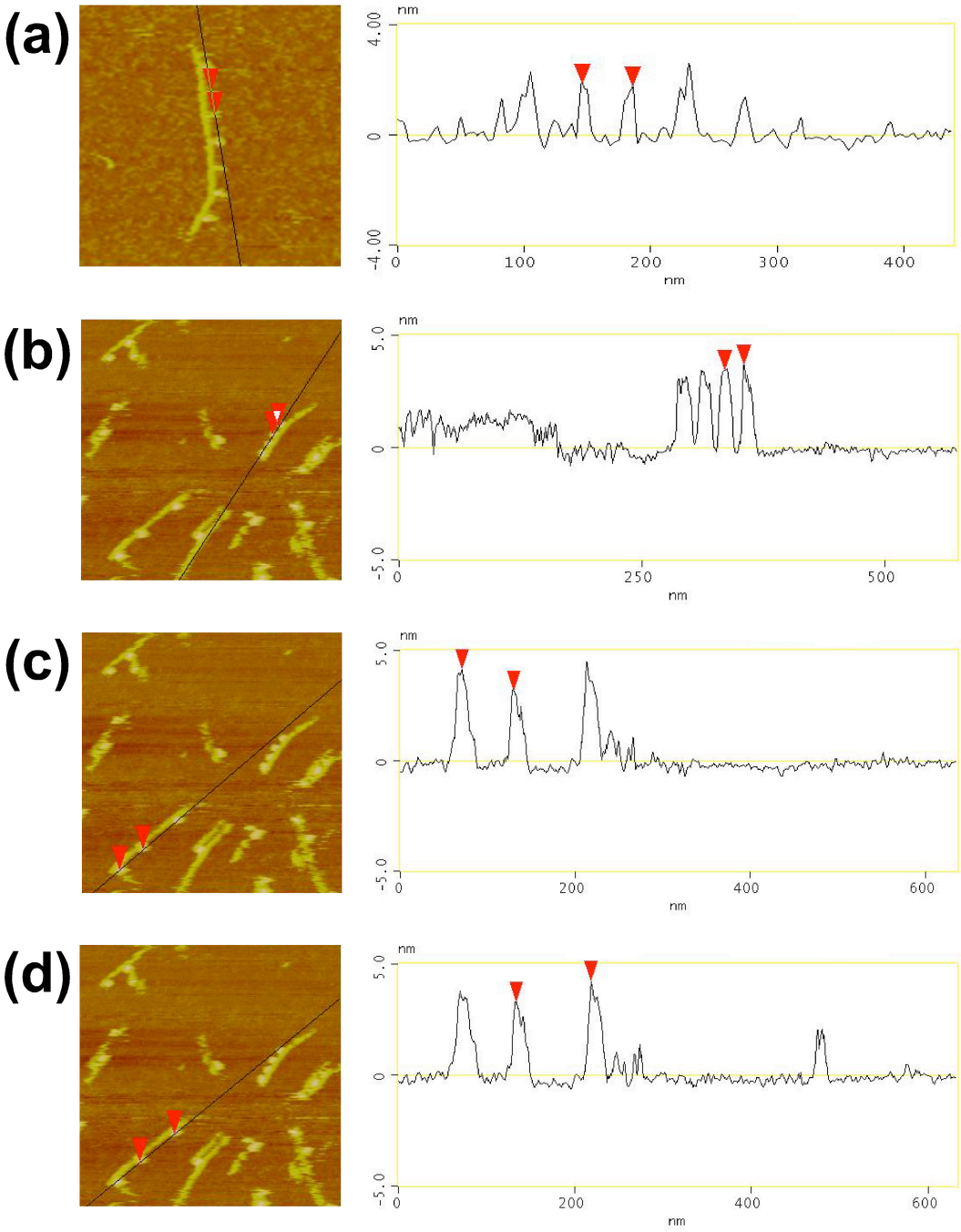

Figure S2. *Cross section profile analysis of AFM images containing DNA BTX streptavidin linear arrays*. (a) BTX AB tiles assembled with sticky ends; the distance is 39.75nm. (b), (c) and (d) BTX AB tile tiles assembled with blunt ends; the indicated spacings are 19.7 nm, 59.1 nm, and 84.6 nm, respectively. The dimensions of the AFM images the same size shown in Figures 3c and 3d.