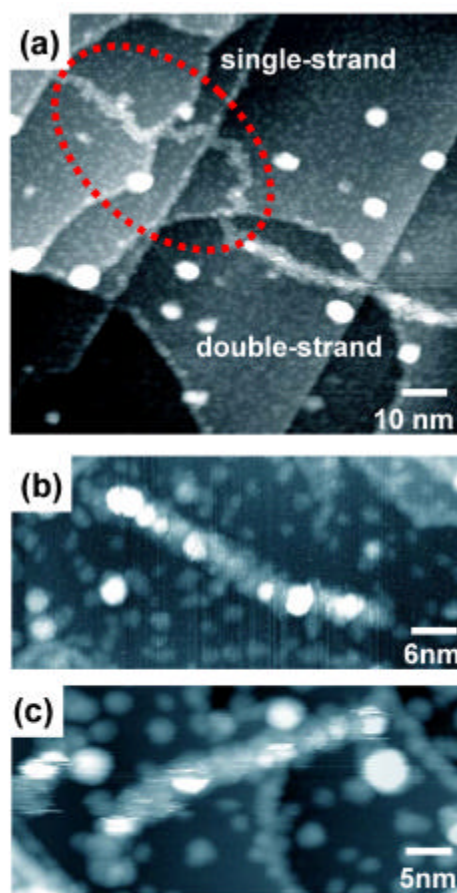


## Electronic Supplementary Information



STM images of (a) commercial Poly(dG)·Poly(dC), (b) and (c) synthesized Poly(dG)·Poly(dC) **1** deposited on atomically flat Cu (111) substrates using a pulse injection method. STM images are taken at bias voltages and tunneling currents of (a)+1.5 V, 1 pA, (b) + 2 V, 1 pA and (c) +2 V, 1 pA, respectively. The observation of a molecule clarified that single-chain parts (with a height of 2.5 Å), which is a structural defect, and double-chain parts (with a height of 4.0 Å) are mixed in the commercially offered Poly(dG)·Poly(dC). The diameter of DNA is usually estimated to be 2 nm, but it is reported that the height of DNA that is on a copper substrate for STM measurements is about 4-5 Å<sup>Ref 1,2</sup>. Because of the flexibility of single-chain DNA, we observed a number of bending structure in the single-chain part of the DNA (enclosed area by the dotted line in the circular frame of (a)). The double-chain part of the DNA formed a straight structure without bending. On the other hand, in the synthesized DNA, we observed no bending structure that was seen in the single-chain parts of the commercially offered DNA, and its height was flat and about 5-6 Å. Therefore the synthesized DNA has the double helix structure with no defect.

## Reference

1. H. Tanaka, C. Hamai, T. Kanno and T. Kawai, *Surf. Sci.* 1999, **432**, L611.
2. H. Tanaka and T. Kawai, *Surf. Sci.* 2003, **539**, L531.