

Discovery of a new ladder form of DNA: potentiality of atomic assignment with STM

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DNA has been expected as an exotic material for the nanometer-scale device. It is interesting to observe directly the structure of DNA in the nanometer scale.

Then, STM has been utilized to realize visualization of DNA. However, the large diameter of DNA prevented us from visualizing it with STM in atomic resolution, so far. Here, we demonstrate images of double stranded, but newly found extended-ladder form of DNA on HOPG with actually atomic resolution in air. DNA takes two different forms on HOPG: one is the Watson-Crick type structure as in Fig. 1; the other is the present form shown in Fig. 2, which meets a required condition for STM to reach atomic resolution. By increasing S/N ratio, the present finding might open a possibility to assign base sequences directly with the images.

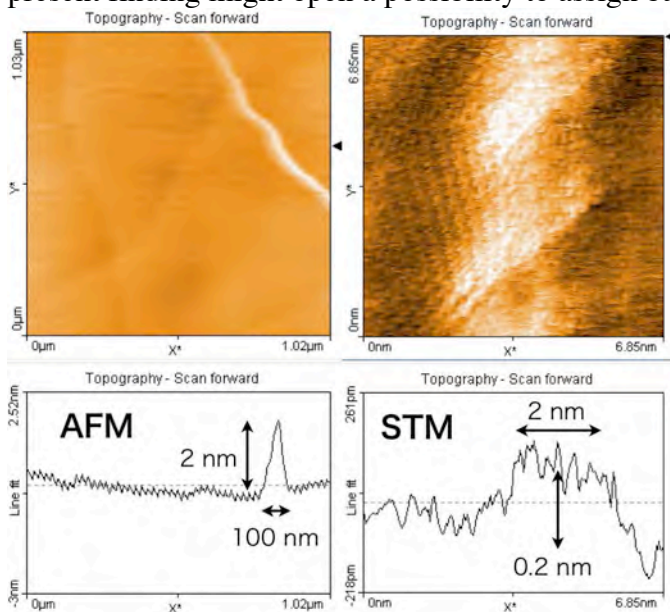


Fig. 1: SPM images of a double helix DNA.

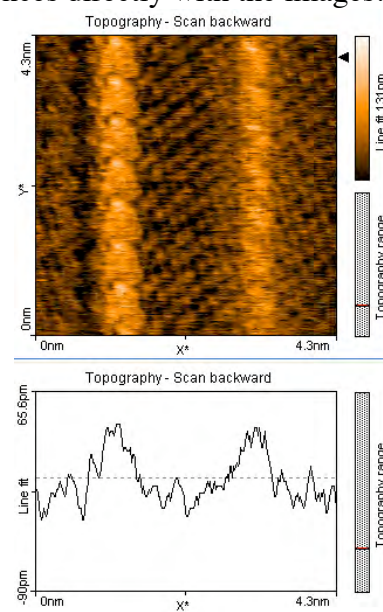


Fig. 2: STM image of a new ladder form DNA.