

Investigation the tip-sample interaction of the AFM for biological nano scale analyses

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Atomic force microscope phase lag imaging of protein-DNA oligonucleotide complexes has been performed to visualize the immobilized oligonucleotides on the protein surface. In normal sample conditions, neither the topographic nor phase lag images show any discriminate signals for the immobilized oligonucleotides. Use of a highly humid incubator, controls the surface humidity. Thereby, it reveals the oligonucleotide location by the local difference of tip adhesion distribution. The resultant phase lag image shows extremely strong signals in the center of the protein surface, indicating the location of oligonucleotides. This experiment, however, demonstrates the strong adhesion force between the tip and the sample leads to the production of abnormal image artifact. In the presentation, we will show the current effort to reduce the imaging artifact by a new tip preparation method.