

AFM OF DNA: A PRACTICAL PROCEDURE FOR SAMPLE IMAGING UNDER DRY NITROGEN

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Imaging DNA over flat surfaces in air is still a big challenge if high resolutions and reproducibility are desired. The main reason of these difficulties is the thin layer of adsorbed water that are ubiquitous to surfaces in contact with moist air. When imaging in air, relative humidity has been known to affect both the resolution and measured height of the DNA strands. In the present work, we propose an experimental setup that conditions the samples in a few minutes, producing extremely dry nitrogen atmospheres. This extremely dry nitrogen atmosphere was obtained by enclosing the AFM assemble head in a plastic bag and by re-circulating the gas content with a pump through two copper coils in series and then back to the bag. The first coil was immersed in liquid nitrogen and the second one immersed in water at ambient temperature. During the scanning, the pump was switch off and refluxing stopped to avoid noise. Scanning under dry nitrogen reduced the relative humidity, therefore, the width and hight of single-stranded and dsDNA was measured and compared to that found in the literature. Additionally, this form of operation increased the throughput, stability of the samples (they were more strongly attached to the surfaces), and higher repeatability from run to run could be observed.