Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Brownian Motion of Hybridized DNA in the Presence of Base-Pair Mismatch KATHRYN SCHALLHORN, KATHERINE FREEDMAN, PU-CHUN KE, Clemson University, SINGLE-MOLECULE BIOPHYSICS AND POLYMER PHYSICS TEAM — The conformational change of hybridized DNA in solution has been characterized with single-pair fluorescence resonance energy transfer (spFRET), in the presence of base pair mismatch. It has been found that base-pair mismatch, a major form of DNA damage, can affect the flexibility of DNA, as manifested by a change of spFRET efficiency. The averaged FRET efficiency was increased from 50.061 percent to 50.778 percent and to 52.796 percent for no mismatches, 3 base-pair mismatches, and 7 base-pair mismatches, respectively. This is possibly due to the shortened end-to-end distance between the DNA, as well as the weakening of the hydrogen bonds, which are not well formed between the mismatched base-pairs. As a result, the flexibility of the DNA is affected. The implications behind understanding such changes in DNA conformation due to damage extend into major components of molecular cell biology and carcinogen studies.

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Date submitted: 02 Dec 2004 Electronic form version 1.4