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Physical properties of unacetylated chromatin as examined by magnetic tweezers KERRY MCGILL, North Georgia College & State University, DAVID DUNLAP, Emory University School of Medicine, JOHN LUCCHESI, Emory University — As the source of genetic material, DNA is involved in a variety of biological processes like transcription, cell replication, and more. In these processes, DNA is manipulated into different structures and is subjected to different levels of physical force on a molecular scale. When tension is applied to one hierarchical structure called chromatin, it appears to behave like a Hookian spring. The base component of chromatin is a nucleosome, which is constructed when DNA coils around octamers of histone proteins. The histones can become acetylated—a chemical process in which an acetyl functional group attaches to amino acids of the histones, often lysines. Acetylation may loosen chromatin's coils and therefore lower the amount of tension required to stretch the chromatin. Comparing the levels of tension required to stretch acetylated chromatin could reveal, directly, physical differences in the chromatin fiber that bear ion the function of the DNA molecule. Work presented will be the investigation of unacetylated chromatin.

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