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Dynamics of Nucleosome Arrays

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DNA sites wrapped into chromatin are sterically occluded from proteins that must bind for processes such as RNA transcription and DNA repair. However, the role of chromatin compaction in biological function is poorly understood. To understand the biological functions of chromatin compaction, we constructed nucleosome arrays that are built with a tandem repeat of high affinity nucleosome positioning sequences, which contain probes for DNA accessibility and chromatin structure. I will describe our results that use restriction enzyme digestion and fluorescence resonance energy transfer to determine the probability for DNA site exposure within compacted nucleosome arrays and the time scale for changes in chromatin compaction. I will then discuss how these results help explain how proteins gain access to DNA sites buried within chromatin.