Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Histone octamer acetylation affects the free energy of nucleosome formation[1] ALEX MOONEY, Department of Physics, The Ohio State University, MRIDULA MANOHAR, ANNICK EDON, Department of Biochemistry, The Ohio State University, ROBIN NAKKULA, Department of Physics, The Ohio State University, JENNIFER OTTESEN, MICHAEL POIRIER, Department of Biochemistry, The Ohio State University — Nucleosomes, histone octamer-DNA complexes, form the fundamental repeating units of eukaryotic chromatin. Numerous post-translational modifications of histone octamers are found *in vivo* and are known to play roles in gene regulation and DNA repair, but the molecular functions of these modifications are not well understood. In this study we consider the effects of acetylating histone protein H3 residues Lys^{115} and Lys^{122}. These modifications reduce the positive surface charge of the histone octamer at contact points with the negatively charged DNA phosphate backbone and add steric bulk in the dyad region. We report results from competitive reconstitutions that show the free energy of nucleosome formation between wild-type and modified histone octamer binding to a strong nucleosome positioning sequence is reduced. These results suggest that these modifications may be involved in nucleosome assembly and disassembly.

[1]This work was supported by a Career Award in the Basic Biomedical Sciences from the Burroughs Wellcome and NIH grant No. R01 GM083055

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Date submitted: 01 Dec 2008 Electronic form version 1.4