

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Single Molecule Study of Metalloregulatory Protein-DNA Interactions SUSANTA SARKAR, JAIME BENITEZ, ZHENGXI HUANG, QI WANG, PENG CHEN, Cornell University — Control of metal concentrations is essential for living body. Metalloregulatory proteins respond to metal concentrations by regulating transcriptions of metal resistance genes via protein-DNA interactions. It is thus necessary to understand interactions of metalloregulatory proteins with DNA. Ensemble measurements provide average behavior of a vast number of biomolecules. In contrast, single molecule spectroscopy can track single molecules individually and elucidate dynamics of processes of short time scales and intermediate structures not revealed by ensemble measurements. Here we present single molecule study of interactions between PbrR691, a MerR-family metalloregulatory protein and DNA. We presume that the dynamics of protein/DNA conformational changes and interactions are important for the transcription regulation and kinetics of these dynamic processes can provide useful information about the mechanisms of these metalloregulatory proteins.

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Date submitted: 03 Dec 2006

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