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Probing protein - DNA interaction by single molecule and structural analysis

J. Jin^{1,2}, T. Lian¹, C. Gu³, Y. Gao^{1,3}, Y. Sun¹, X. Xie^{1,4}, X. Su¹

¹Peking University, Biodynamic Optical Imaging Center (BIOPIIC), School of Life Sciences, Beijing, China, ²Peking University, Academy for Advanced Interdisciplinary Studies, Beijing, China, ³Peking University, Institute of Theoretical and Computational Chemistry, College of Chemistry and Molecular Engineering, Beijing, China, ⁴Harvard University, Department of Chemistry and Chemical Biology, Cambridge, MA, USA

In proteins, conformational change impacting their function has been well investigated in the past decades, and was named 'allosteric effect'. However, in DNA-protein interaction, the concept of DNA conformational change caused by DNA-protein binding will affect another nearby DNA-binding protein has not been well investigated and understood. Combined with structural biology and Single Molecule Assays, we can now probe and study allosteric propagation through DNA which exists as a fundamental property in DNA-protein interaction, and this allosteric effect through DNA can fine tune gene expression. Therefore, DNA conformational changes should be seriously considered and analyzed for DNA –protein interactions in general.

Keywords: DNA-protein, allosteric effect, transcription regulation