The School of Natural Sciences
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Physics Seminar Series:

Parallel Lipoplex Folding Pathways Revealed
Using Magnetic Tweezers

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S&E 300

ABSTRACT:
Magnetic tweezers are a powerful tool in the investigation of single molecule DNA interaction with protein or polymer. Lipid-coated DNA nanoparticles (lipoplexes) are a potential gene delivery tool with promising therapeutic applications. The mechanism of lipoplex assembly remains poorly understood. In this approach, we explored DNA packing by a cationic lipid DSTAP (distearoul trimethylammonium-propane). It is showed that lipoplex folding occurs via two parallel pathways even at the single molecule level. The progress through the two pathways can be monitored in real time using single DNA manipulations. The relative efficiency of the two pathways can be varied by external conditions.

BIOGRAPHY:
Zhiqiang Sun received a B.S. in Physics from the Shandong University, China in 2004 and a Ph.D. in Biophysics from the Institute of Physics, Chinese Academic of Science in 2010. He was then a postdoctoral research fellow with Dr. Valentin Rybenkov in Chemistry and Biochemistry at the University of Oklahoma working on the DNA compaction by lipid with magnetic tweezers.

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