

# Direct and sensitive physical methods uncover dynamic and sensible features of biological systems.

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Biological systems are naturally dynamic. It is quintessential to observe their dynamic features in order to fully understand how a life emerges. Dynamic details of biological systems had remained poorly explored and understood until recently because traditional tools in biology are not optimal for dealing with such issues and biological systems had drawn limited attention from physics community due to their extreme complexity and baffling spatiotemporal characteristics. Fortunately, several innovative approaches with high spatiotemporal resolutions and single-molecule sensitivity developed over past decades have changed the game entirely.

In this talk, I will show how new methods in single-molecule biophysics and optical microscopy help gain novel insights into conformational dynamics of DNA and intracellular cargo and organelle dynamics in living cells.

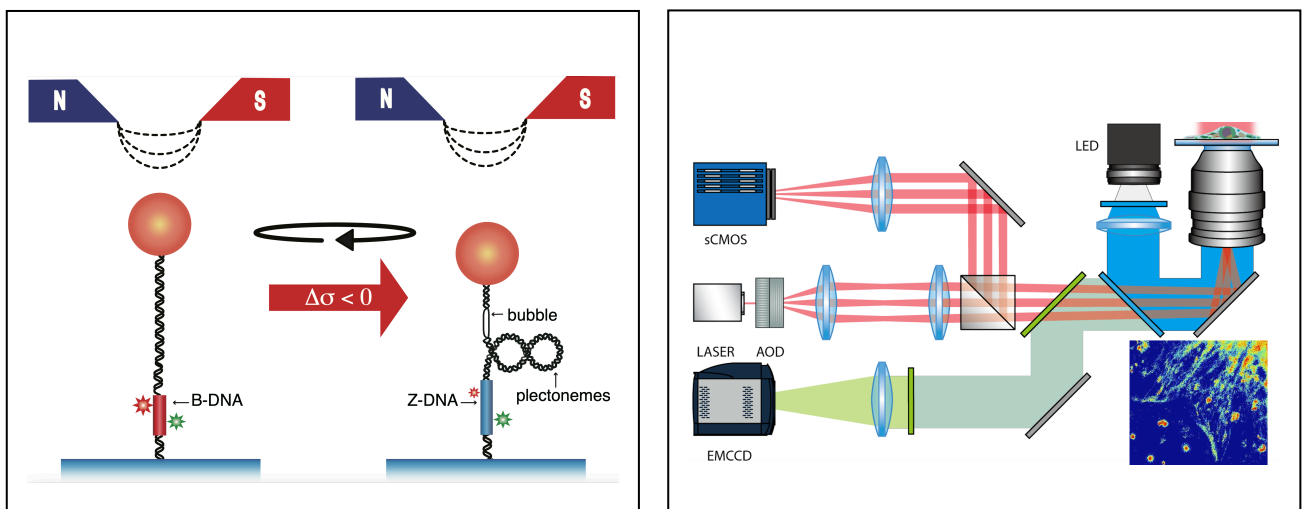


Fig 1. (left) Conformational dynamics of DNA revealed by smFRET-magnetic tweezers (right) Live-cell cargo dynamics tracked by interferometric scattering microscopy (iSCAT)