[Talk 3] 1D Long-range communications on mismatched DNA during DNA mismatch repair

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The temporal and mechanistic order of molecular events is essential for life. A longdistance communication between a nucleotide mismatch and a downstream site is required to initiate DNA mismatch repair (MMR) that corrects the mismatch: 1) MutS protein recognizes nucleotide errors. 2) ATP binding to the MutS bound to the mismatch induces ATP-bound MutS sliding clamp. 3) MutL protein interacting with the ATP-bound MutS transmits the mismatch recognition to generate the distant strand break site (hundreds to thousands base pairs from the mismatch) through the interaction with MutH protein. However, the mechanism of communicating mismatch finding to a distant downstream site remains highly controversial for decades. I will present how our single-molecule studies have elucidated the mechanics of the longdistance interaction during MMR.