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Fis protein induced λ F-DNA bending observed by single-pair fluorescence resonance energy transfer FU CHI-CHENG, Institute of Atomic and Molecular Science, Academia Sinica, Taipei, Taiwan , FANN WUNSHAIN , Institute of Atomic and Molecular Science, Academia Sinica, Taipei, Taiwan , YUAN HANNA S., Institute of Molecular Biology, Academia Sinica, Taipei, Taiwan — Fis, a site-specific DNA binding protein, regulates many biological processes including recombination, transcription, and replication in E.coli. Fis induced DNA bending plays an important role in regulating these functions and bending angle range from $\sim 50^\circ$ to 95° dependent on the DNA sequence. For instance, the average bending angle of λ F-DNA (26 bp, 8.8nm long, contained λ F binding site on the center) measured by gel mobility shift assays was $\sim 94^\circ$. But the traditional method cannot provide information about the dynamics and the angle distribution. In this study, λ F-DNA was labeled with donor (Alexa Fluor 546) and acceptor (Alexa Fluor 647) dyes on its two 5' ends and the donor-acceptor distances were measured using single-pair fluorescence resonance energy transfer (sp-FRET) with and without the present of Fis protein. Combing with structure information of Fis-DNA complex, the sp-FRET results are used to estimate the protein induced DNA bending angle distribution and dynamics.

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