

FORCE MEASUREMENT OF DNA WITH PAIR DISTRIBUTION FUNCTION

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Quantifying the forces between DNAs is essential to improve our understanding of fundamental biological processes. Using the small angle X-ray scattering (SAXS) technique, we have probed the effective forces between isolated DNAs (25 base pair, 48e bare charge) in solution by measuring DNA-DNA **pair distribution function**, from which the inter-DNA pair potentials are obtained following the generalized one-component method (GOCM). We report the measured effective interaction charges under varying DNA concentrations, counterion concentrations and valences. Electrostatic repulsion dominates in monovalent counterion solutions, and quickly diminishes with the addition of divalent counterions. Our quantitative measurement of the effective inter-DNA forces should provide valuable guidance to future theoretical studies.