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**Supporting Material**

**Interaction of oxazole yellow dyes with DNA studied with hybrid optical tweezers and fluorescence microscopy**

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# **Supplementary information for**

## **Interaction of oxazole yellow dyes with DNA studied with hybrid optical tweezers and fluorescence microscopy**

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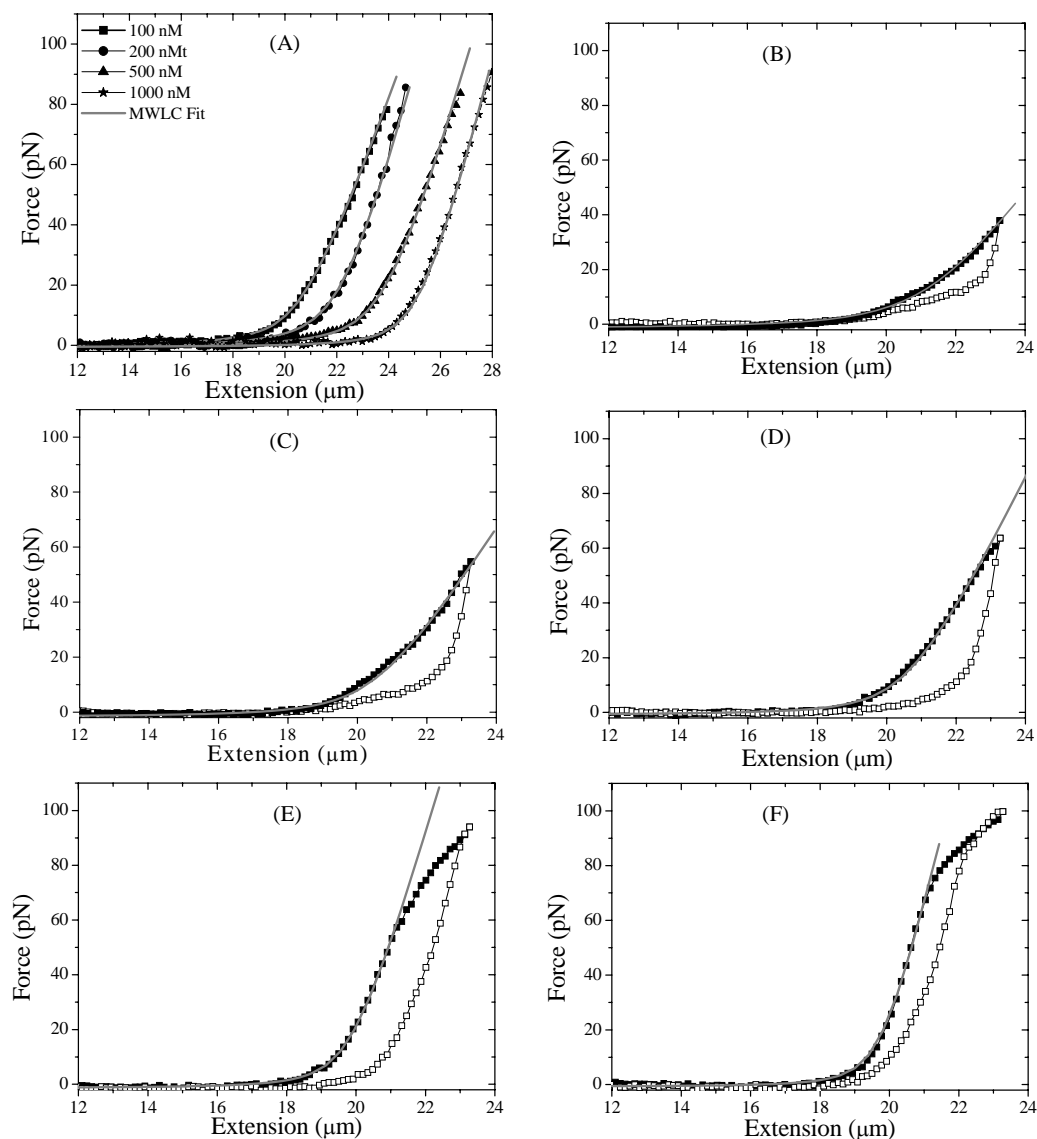


Fig. S1 (A) Force extension curves of DNA-YOYO complex (only extension curves) pulled at 3  $\mu\text{m/s}$  in the presence of various concentrations of YOYO, gray lines presents the MWLC fit to the extension curves. Parameters resulting from the fitting are presented in Table 1 in the main text.

(B-F) Force extension of DNA-YOYO complex at 100 nM pulled at different pulling speeds (B-F: 1, 2, 3, 9 and 20  $\mu\text{m/s}$ ). Closed and open symbols present extension and relaxation respectively. The gray line presents MWLC fit to the extension part of each curve. Fit parameters are presented in Table 1 in the main text.

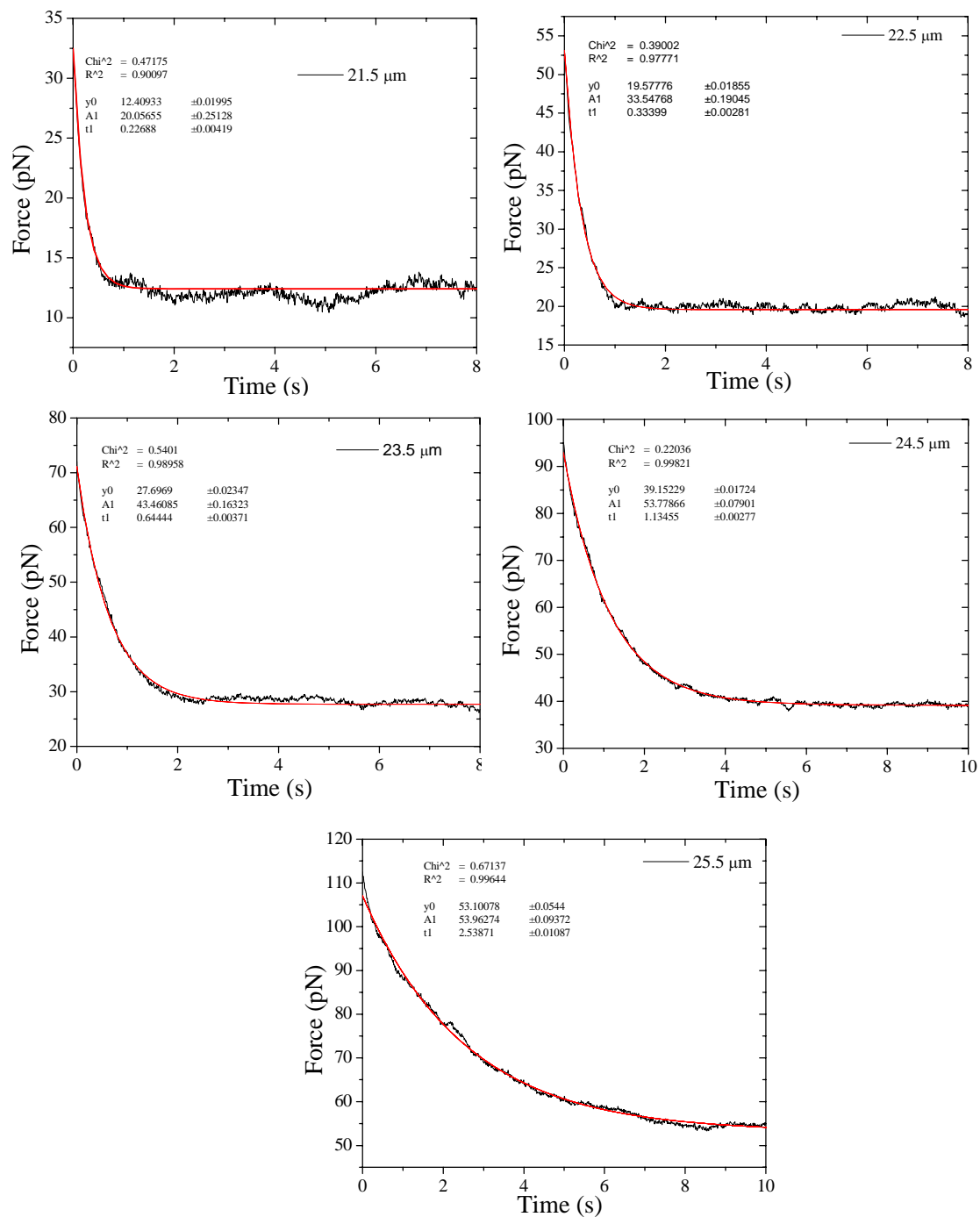


Fig. S2 Exponential fit to the data presented in the Fig. 4A.

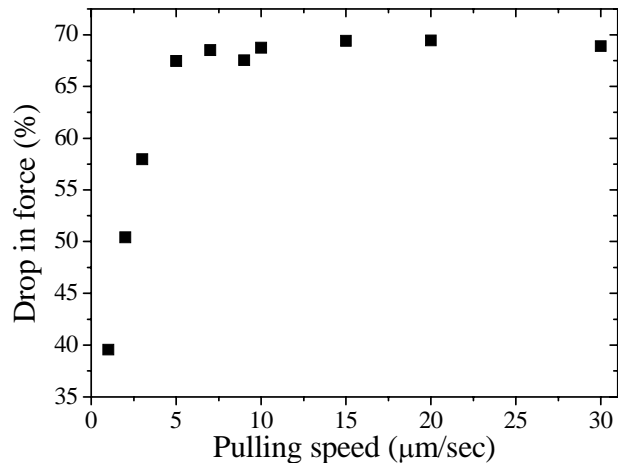


Fig. S3 Relative drop in the force as a function of the pulling speed obtained from the force relaxation experiments. In all cases the molecule has been stretched to 23.3  $\mu\text{m}$  at different pulling speeds. The relative drop in the force is the reduction in the force during the relaxation normalized to its initial value.

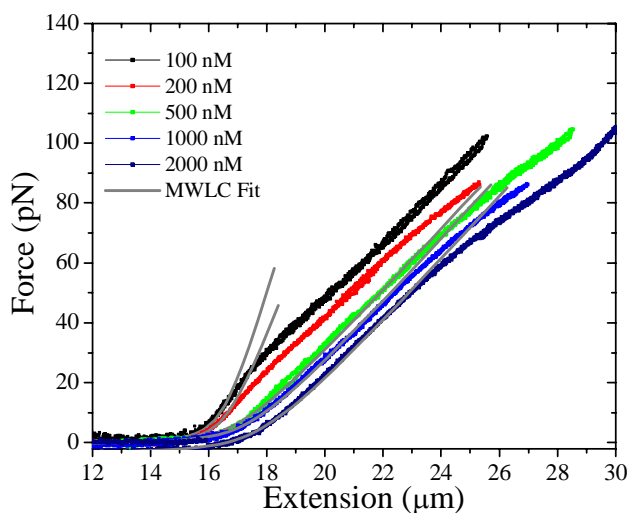


Fig. S4 Force extension curves of DNA-YO complexes at various YO concentrations. The gray line presents the fit to the MWLC model. Fit parameters are presented in Table 3 in the main text.

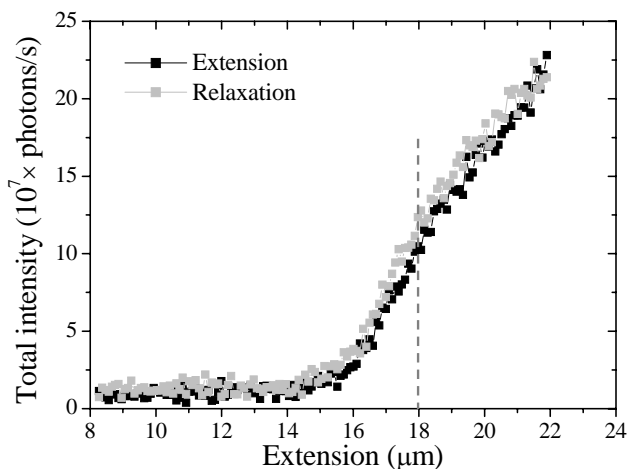


Fig. S5 Total fluorescence intensity of the DNA-YO complex as function of extension at 100 nM YO. Dotted gray line indicates the changes in slope of the total fluorescent intensity of DNA-YO complex at 18  $\mu\text{m}$ .

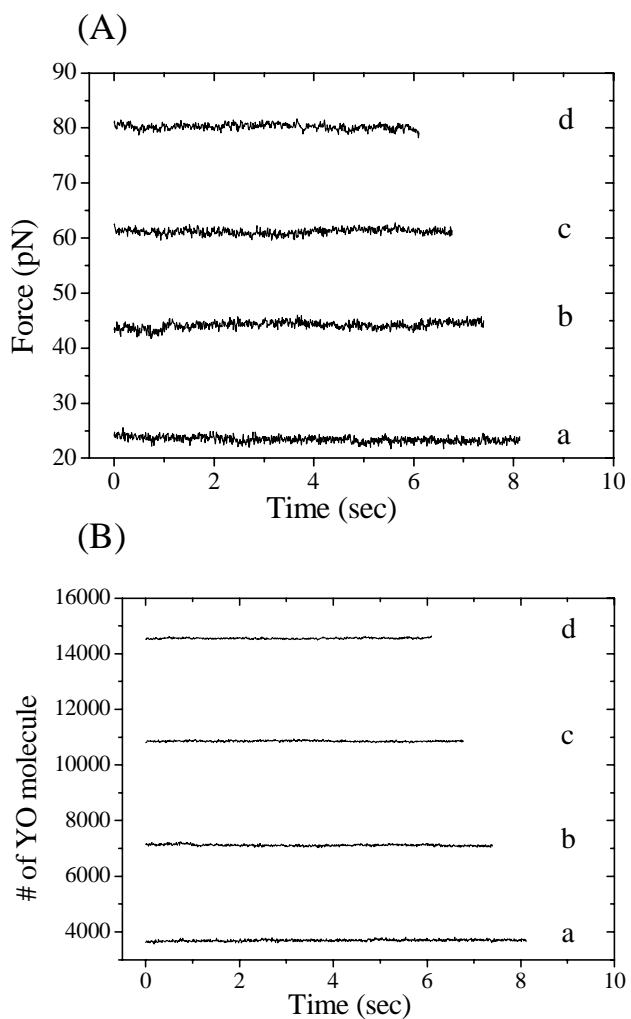


Fig. S6 (A) Force as a function of time recorded as DNA molecules are pulled to preset extensions at  $3\mu\text{m/s}$  pulling speed and then kept at these extensions in the presence of

100 nM YO in the buffer. Curve a, b, c and d represent constant extensions of 18, 20, 22, and 24,  $\mu\text{m}$  respectively. (B) presents the number of YO molecules on DNA as function of time; the data points presented here are derived from the Fig. S5(A) using Eq. 2.

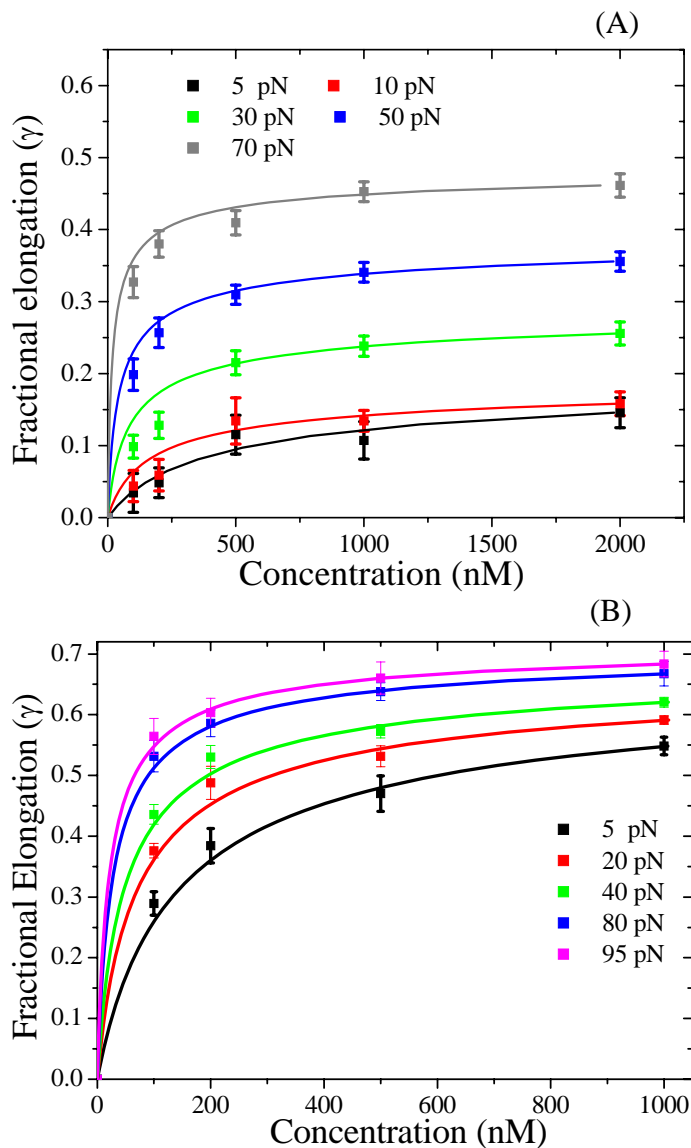


Fig. S7. Fractional elongation of (A) DNA-YO and (B) DNA-YOYO as function of dye concentration at different forces. The data are curve fitted with McGhee-von Hippel binding isotherm.

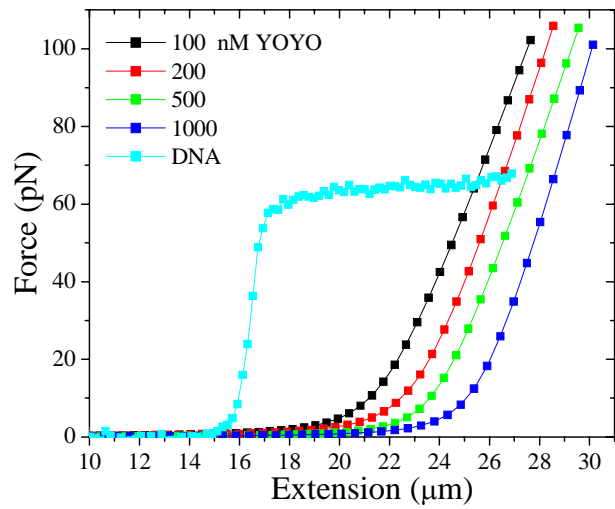


Fig. S8. Equilibrium force extension curves of DNA-YOYO complex obtained at various concentrations. Compared with bare DNA force extension curve.