Supplemental Data

Direct Observation of DNA Distortion by the RSC Complex

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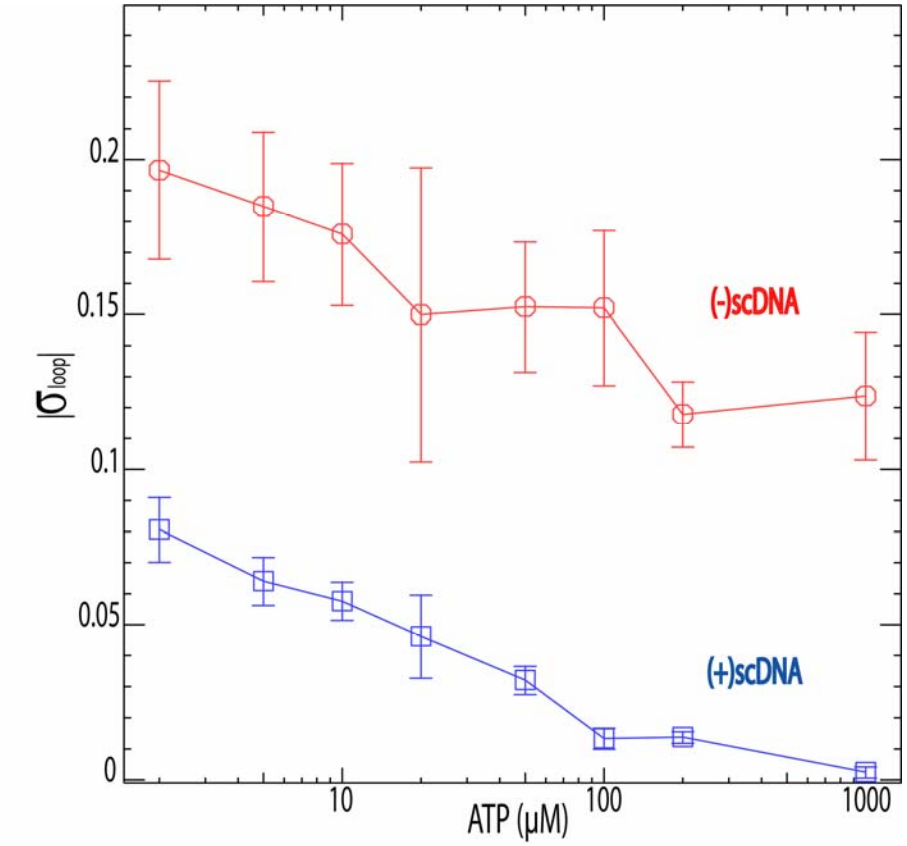

Figure S1: Supercoiling degree inside the translocated DNA loop $|\sigma_{loop}|$ as a function of ATP on (+) or (-)scDNA, computed from the measurements of $\delta l_n, \delta l^+$ and δl^-, see Fig.Error! Reference source not found.B, assuming $l_t^{\pm} = \delta l_n$, see text for details. For (-)scDNA the value displayed is an upper bound on the degree of supercoiling in the loop.

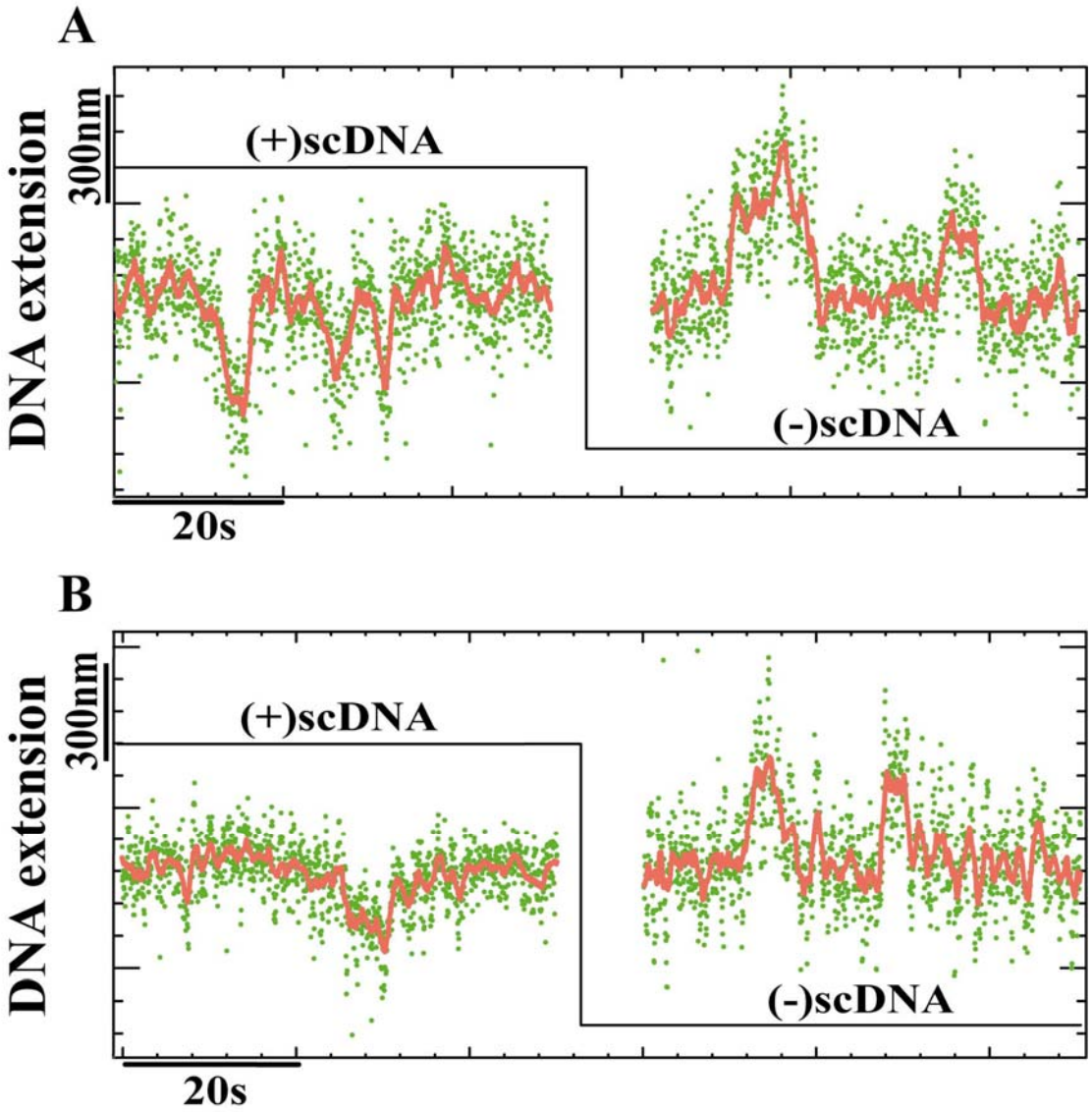

Figure S2: Transient changes in the DNA extension associated with the human SWI/SNF ATPase: (A)BRG1 and (B) hBRM. Time traces on positive and negative supercoiled DNA at F=0.5pN, in presence of 250μM ATP for BRG1 and 1mM ATP for hBRM (raw data (green), raw data averaged over 1sec. (red)). Notice the similarity of those traces to the ones observed for RSC (Fig.4A).

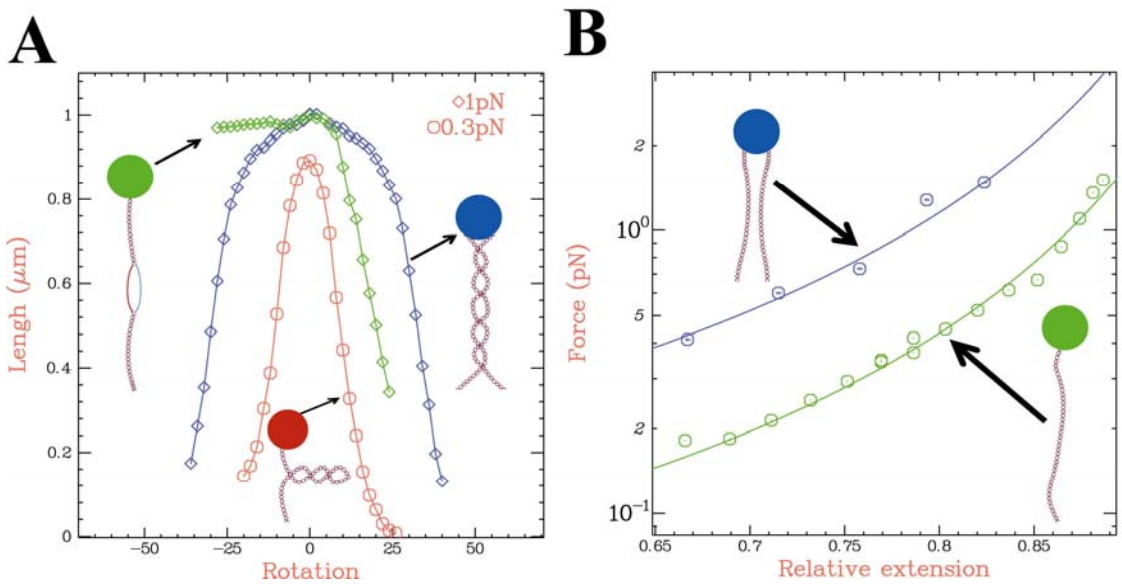

Figure S3: Variation of the DNA extension l as a function of the number n of rotations and the stretching force F. (A) When a single DNA tethers the magnetic bead to the surface, the DNA's extension is symmetric with respect to $n \rightarrow -n$ at a low forces (red trace, F=0.3pN) and asymmetric at high forces (green trace, F=1pN) as a result of partial denaturation upon unwinding (i.e. for n<0). That is not the case when the bead is anchored by two (nicked) molecules: it is always symmetric (blue trace, F=2pN). (B) The variation with force of the relative extension $\zeta = l/l_0$ (l_0 is the DNA contour length) is different if a bead is anchored by one or two molecules: the force required to stretch two molecules is twice the force necessary to stretch a single DNA molecule by the same amount.