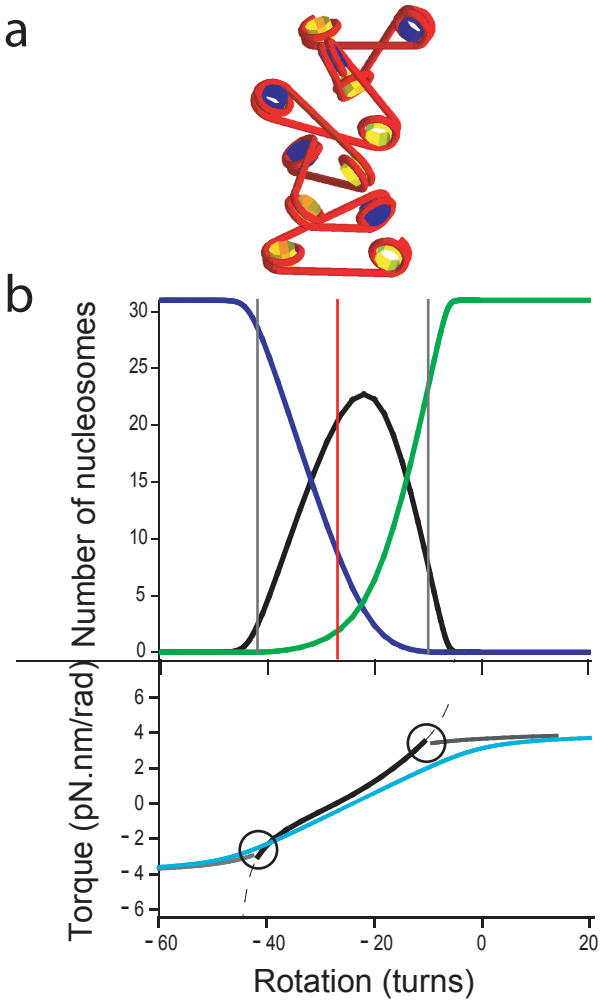

Supplementary figure 4. The "three-state" fiber. **(a)** Modeling of the torsionally-relaxed (zero torque) fiber containing 60% "open" nucleosome (yellow) and 40% "negative" ones (dark blue). Note that the maximal-length fiber (state 1 in **Fig. 5b**; main text) is torsionally stressed by ~+5 turns relative to the relaxed fiber (**Fig. 5c**, main text), explaining the differences with the molecular models presented in **Fig. 5b** main text (state 1). **(b)** Top: Predictions for the number of nucleosomes in the negative (blue), open (black) and positive (green) states as a function of rotation. The fiber contains 31 nucleosomes, and the energy Un and Up are set to 0.7 kT and 2 kT, respectively. The red vertical line corresponds to the relaxed state. The two grey vertical lines give the positions of the onsets of plectonemes formation (see **Supplementary section 3**). Bottom: Torque-*vs*.-rotation as predicted by the worm-like rope model (light blue) and by the three-state model (black, same as **Fig. 5c,** main text). The two regions corresponding to the transitions between the regimes of nucleosome structural transition and plectoneme formation are circled.