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When DNA Collides With Itself ZUBAIR AZAD, ROBERT RIEHN, North Carolina State Univ — Long range interactions in large DNA molecules are typically modeled as self-avoiding random walks. While this is useful for understanding equilibrium configurations, dynamic behavior may include more complex polymer-polymer coupling. Here we explore the possibility of internal friction within hernias of DNA under nano-confinement and fluid flow. We study the rates at which DNA hernias form and recoil at various flow speeds and hernia sizes. The formation and recoil behaviors point to possible entanglement between two genetically distant regions of DNA as they flow in the same direction. To explore internal friction between two strands moving in opposite directions, we scan the two strands comprising the hernia as well as two independent molecules against each other. From these studies, we address the drag or friction forces on two molecules under confinement and compare to the analogous system of one nano-confined molecule.

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