

Abstract Submitted
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Tales told by tails: watching DNA driven through a random medium JUAN GUAN, BO WANG, SUNG CHUL BAE, STEVE GRANICK, U of Illinois - Urbana Champaign — DNA ligation is used to label separately the ends and centers of monodisperse DNA 16 μm in contour length, and 2-color fluorescence microscopy is used to follow with nm resolution how chains migrate through agarose networks driven by electric fields, at both whole chain and segment level. We observe that the leading segment is always a physical chain end which stretches and pulls out slack in the still-quiescent remainder of the chain until the other end is taken up. Heads and tails behave strikingly differently: the leading end of migrating chains migrates more smoothly, whereas motion of the trailing end shows intermittent pauses and jerky recoil. None of the mechanisms imagined classically for this situation - chain reptation, hooking or entropic trapping, appears to fully describe these data obtained from single-molecule visualization.

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