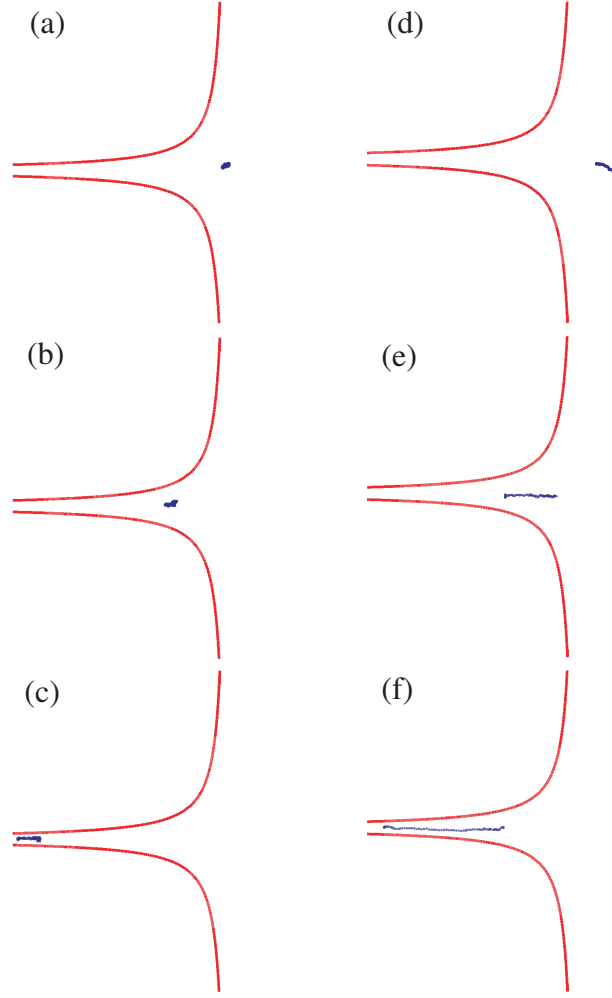
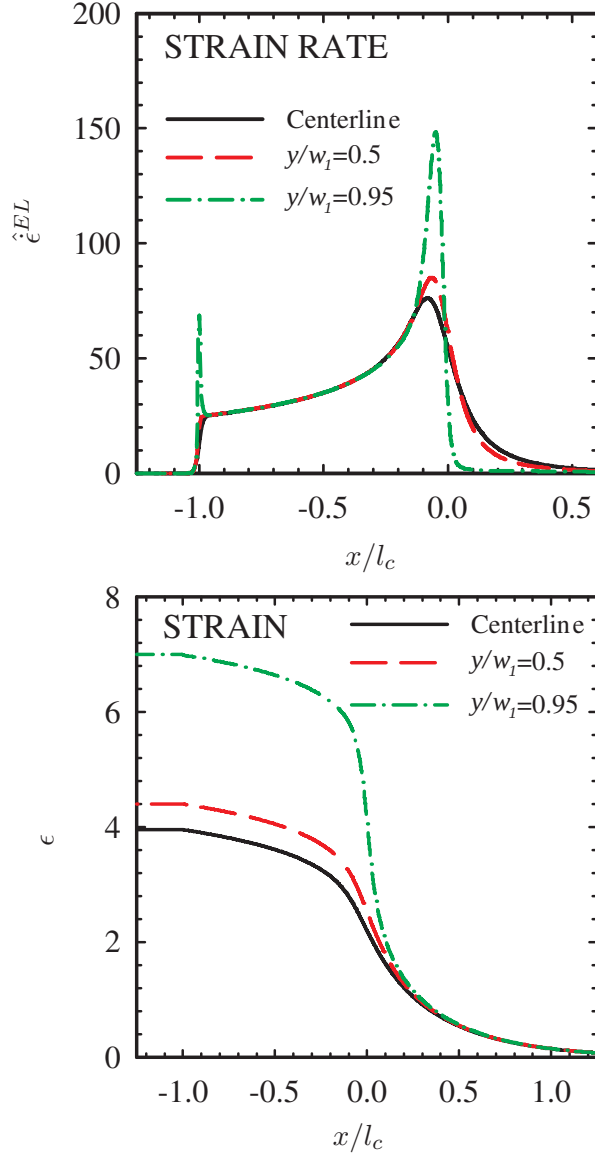




The molecules shown in Fig. 1 (b) and (c) in the main text are redrawn here with channel boundary to show the position of DNA in the channel. Two molecules ((a)-(b)-(c) and (d)-(e)-(f)), which move commonly along the centerline, are sampled and thus the molecules experience a similar kinematic history. Times between two successive snapshots, (a)-(b), (b)-(c), (d)-(e), and (e)-(f) are 0.49, 0.21, 0.77 and 0.15 $\hat{\tau}$, respectively.

Case II



Non-dimensionalized strain rate and strain for different feeding locations in case II of Table 1. Each line starts from $x/l_c=2.1$ with different y locations.