



**Fig. S1.** The breakthrough rate as a function of force is plotted in order to extract the unstressed energy barriers for (a) 5nm probes, (b), 10nm probes, (c),  $\infty$ -probes. Plots for 5nm and 10nm probes reproduced with permission from: B. D. Almquist and N. A. Melosh, *Proc. Natl. Acad. Sci. USA*, 2010, **107**, 5815-5820.