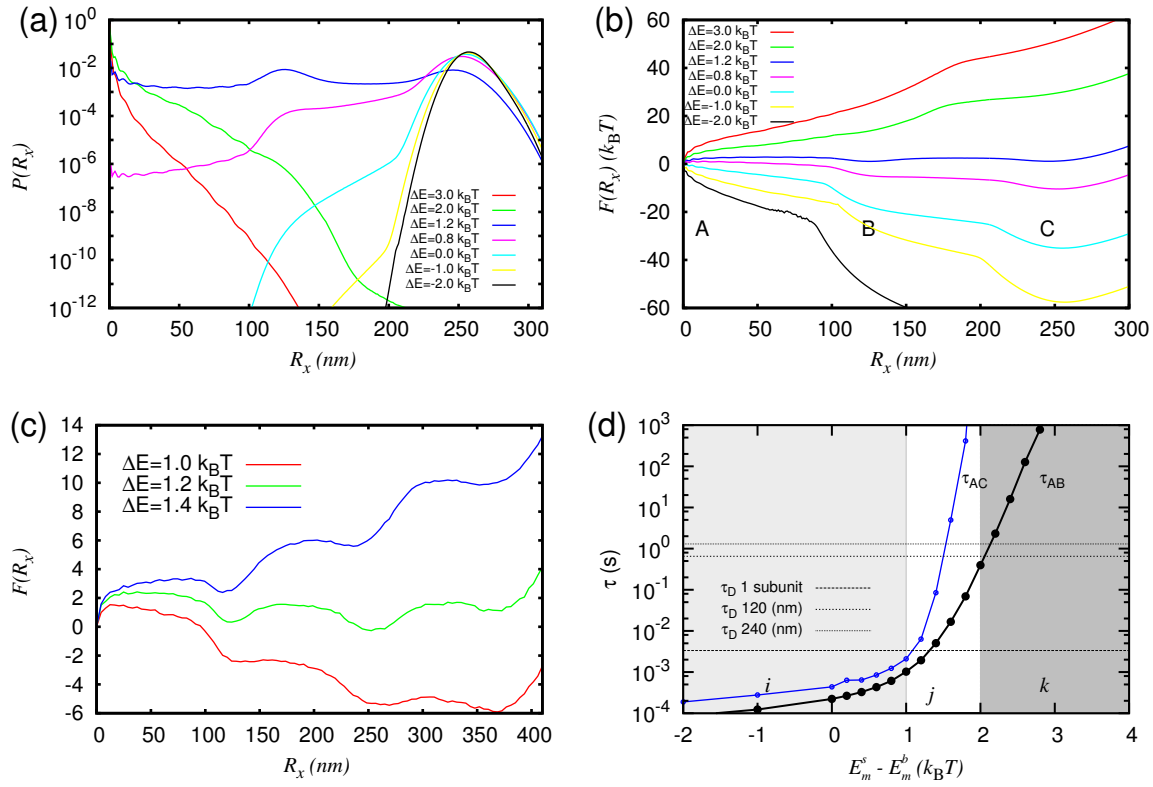

Fig. S 4. $P(R_x)$, $F(R_x)$, **and unzippering timescales.** (a) and (b) are $P(R_x)$ and $F(R_x)$, respectively, for various value of ΔE, where E_m^s is kept fixed at $8.0k_{\rm B}T$ and $L = 34b$. (c) Multiple minima in the free energy can be seen at all values of $R_x = n2\pi r_c$ (see main text) even for a larger length of $L = 49b$. Here the free energy is computed using the pavement method as in Text S2. (d) Unzippering timescale from state A to state B (τ_{AB}) and from state A to state C (τ_{AC}) for various value of ΔE; here E_s^m is kept fixed at $8.0k_{\rm B}T$ and $L = 34b$.