

Supplementary Material for “Discriminating protein tags on a dsDNA construct using a Dual Nanopore Device”

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V. SPHERICAL TAGS AND SIDECHAINS COMPARISON

We compare the cumulative dwell time distributions of the seven spherical tags and the sidechain tags. The spherical tag is heavier in mass ($6m$) and carries a charge $3q$. On contrary, the sidechains are of length $l_{tag} = 6\sigma$ with each of the sidechain beads is of mass m and carries a charge $0.5q$. Fig. S1 ((a)/(b)) show the dwell time distributions of the $L \rightarrow R/R \rightarrow L$ scans for the spherical tags and Fig. S1 ((c)/(d)) shows the same for the sidechains. We observe that both the spherical and sidechain tags produce asymmetry in the dwell time. For the $R \rightarrow L$ scans the dwell time asymmetry is more prominent for the sidechains which matches closer to the experiment.

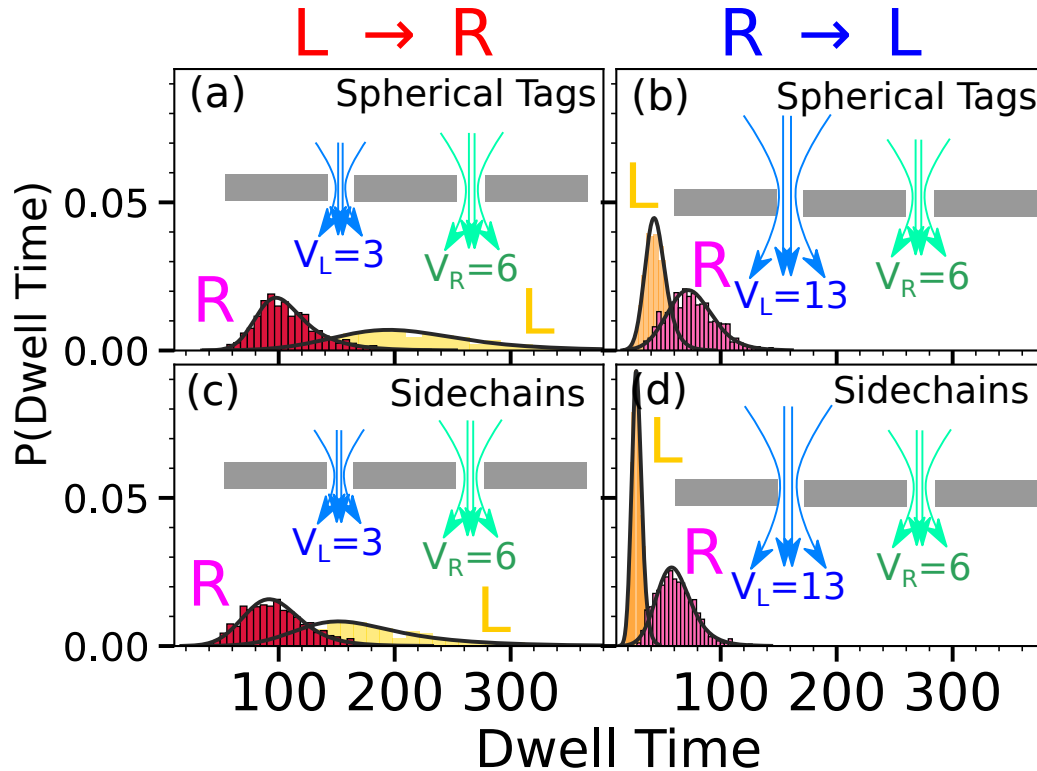


FIG. S1. Cumulative dwell time distributions (a) $L \rightarrow R$ and (b) $R \rightarrow L$ scans for the seven charged ($3q$) spherical tags with heavier mass ($6m$). The next row represent the cumulative dwell time distributions for (c) $L \rightarrow R$ and (d) $R \rightarrow L$ scans for the charged ($q_{tag} = 0.5q$) sidechain tags of length ($l_{tag} = 6\sigma$) For the both cases, for $L \rightarrow R$ translocations left pore voltage is $V_L = 3$ and right pore voltage is $V_R = 6$ while for the $R \rightarrow L$ translocations $V_L = 13$ and $V_R = 6$. The yellow/red and the orange/magenta dwell time histograms are obtained from the left/right pore in $L \rightarrow R$ and $R \rightarrow L$ directions respectively. Schematics of the electrostatic forces on the DNA in the left/right pore are shown by the blue/green arrows (not to scale). The black envelopes represent the exponentially modified Gaussian distribution fit of the dwell time histograms.