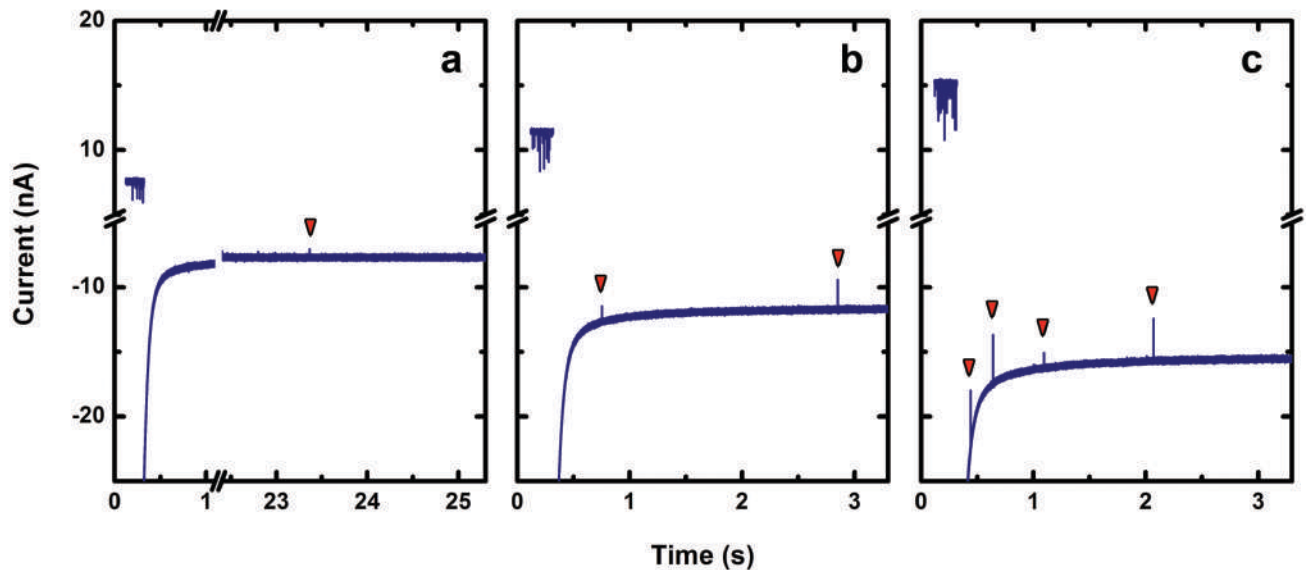# Selective detection and quantification of modified DNA with solid-state nanopores

Autumn Carlsen, Osama K. Zahid, Jan A. Ruzicka, Ethan W. Taylor, Adam R. Hall

Supplementary Figure 1. Recapture of translocated MS-bio90 constructs. Raw current traces showing translocation events of MS-bio90 at positive bias (initial 0.25 s of each trace) followed by subsequent re-capture of translocated material at negative bias. Voltages applied are ±200 mV (a), ±300 mV (b), and ±400 mv (c). Red arrows indicate recapture events. As voltage is increased, we observe a higher efficiency of re-capture. These data demonstrate that the MS-bio90 events measured in our experiments correspond to constructs passing through the SS-nanopore.
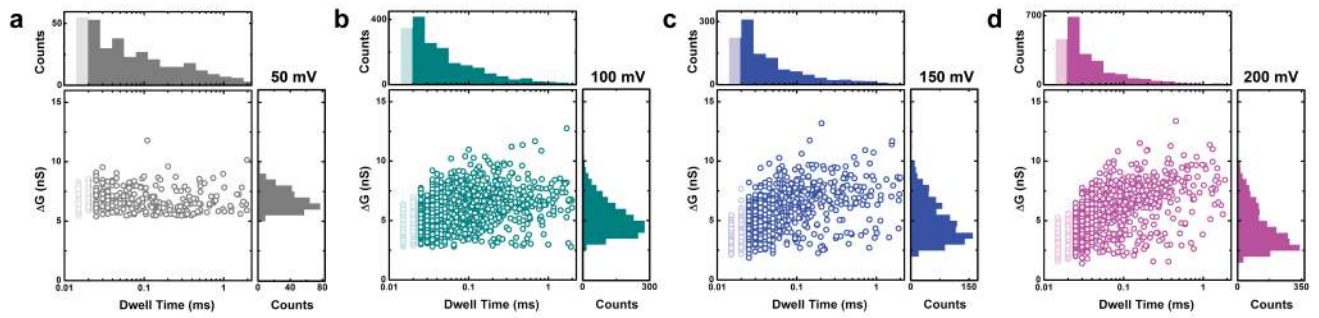
Supplementary Figure 2. Voltage dependence of scatter plots. Conductance blockage vs. dwell time for events measured at a stoichiometry of 1:1 (MS:bio90) and across a range of applied voltage (indicated at upper right of each plot). Total numbers of events considered are 332 (a), 1852 (b), 1129 (c), and 2193 (d). The faded population at the left of each plot represents events with duration below the resolution limit (25 μs). The ΔG histogram profile change may indicate multiple conformations of the MS-bio90 construct during translocation at higher voltage.
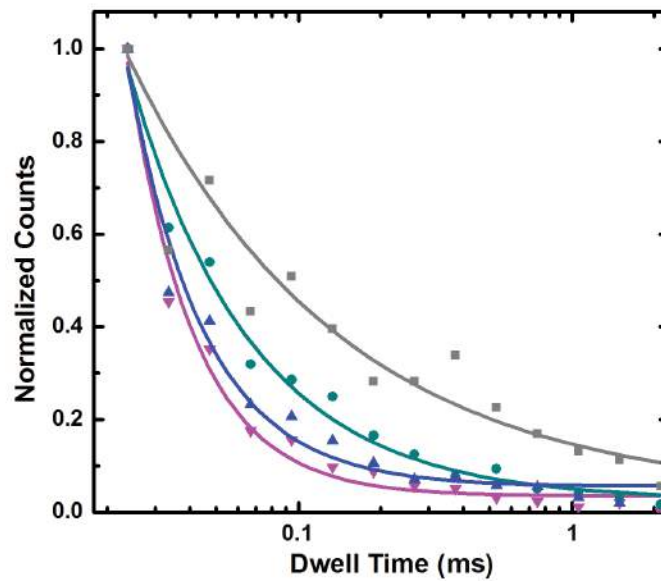
Supplementary Figure 3. Voltage dependence of MS-bio90 translocations. The normalized abundance of MS-bio90 dwell times, plotted from the resolution limit of 25 µs up to 2 ms (from the upper histograms in Supplementary Figure 2). Data displayed (T-B) are for applied voltages of 50 mV (grey squares), 100 mV (cyan circles), 150 mV (blue upward triangles), and 200 mV (magenta downward triangles), respectively. Solid lines are exponential fits to the (log-normal) data, demonstrating that event durations decay faster as applied voltage increase.
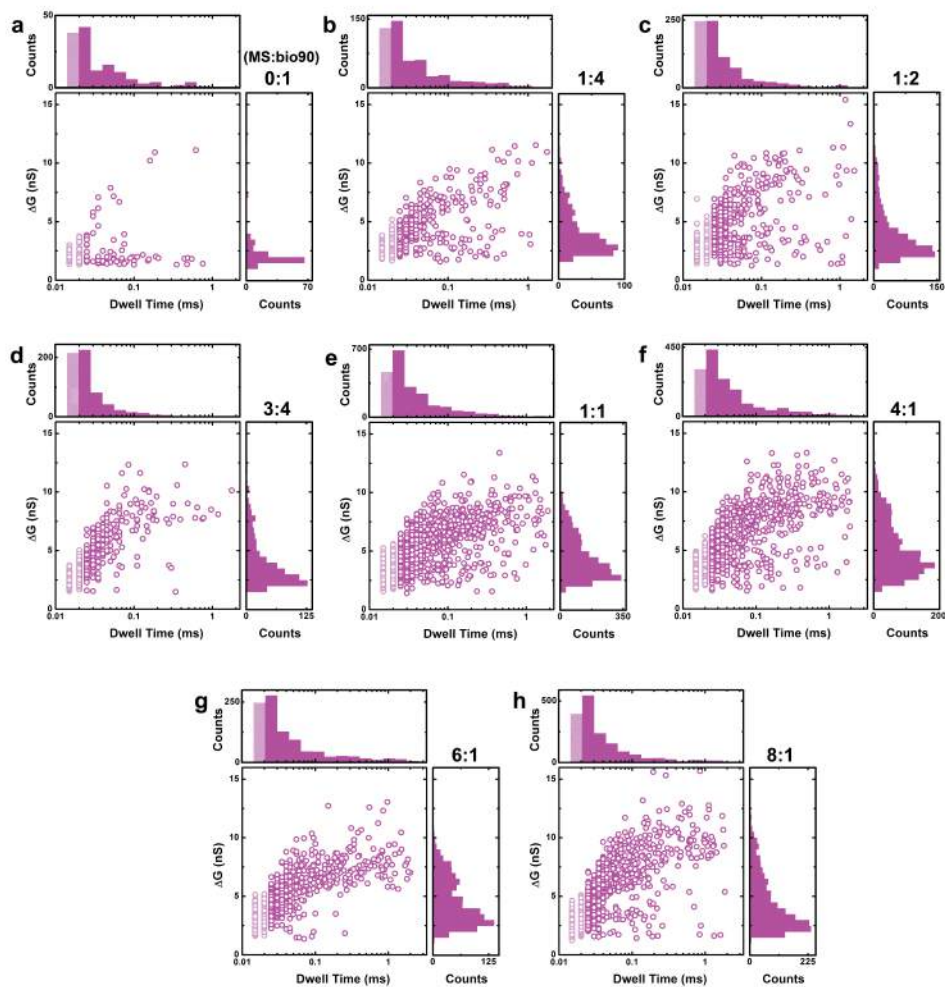
Supplementary Figure 4. Stoichiometry dependence of scatter plots. Conductance blockage vs. dwell time for events measured at an applied bias of 200 mV and across a range of stoichiometries (indicated at upper right of each plot). Total numbers of events considered are 139 (a), 521 (b), 816 (c), 642 (d), 2193 (e), 1528 (f), 982 (g), and 1652 (h). The faded population at the left of each plot represents events with duration below the resolution limit (25 μs).
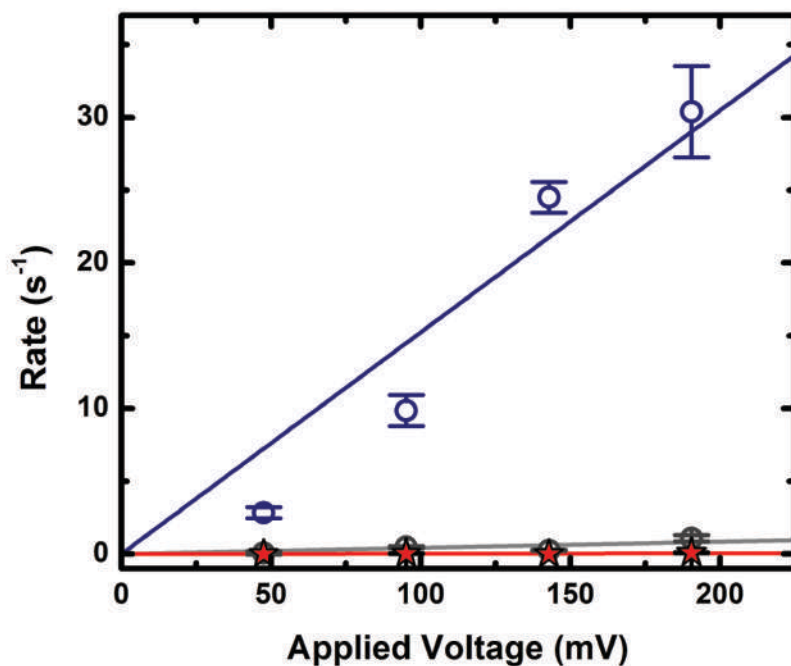
Supplementary Figure 5. Control measurements on non-biotinylated dsDNA. Measured event rate vs. applied voltage for MS mixed with non-biotinylated 95 bp dsDNA at a molar ratio (MS:DNA) of 4:1 (red stars). The mixture of MS and non-biotinylated DNA yields an extremely low event rate, more than an order of magnitude lower than bio90 mixed with MS at the same ratio (blue) and equivalent to that of bio90 with no added MS (grey). Solid lines are linear fits to the data.
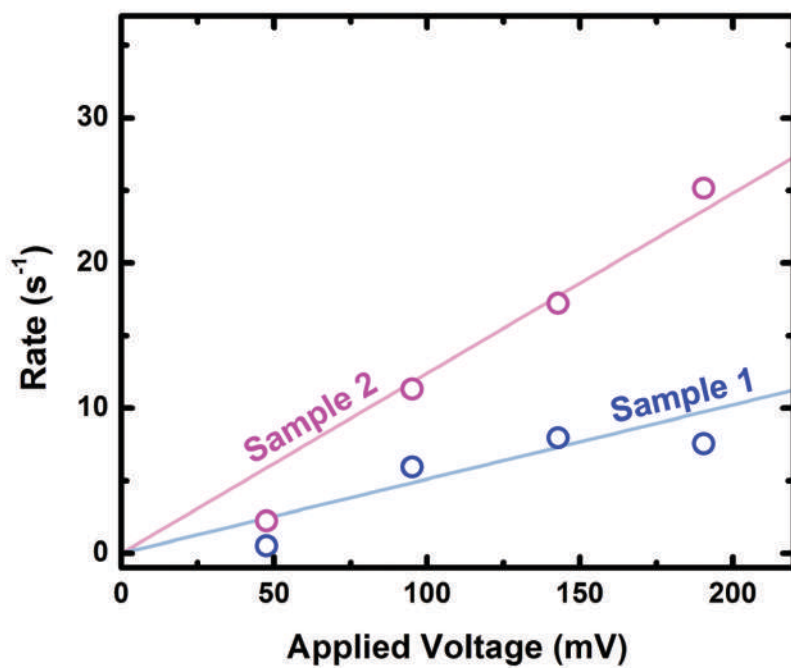
Supplementary Figure 6. Analysis of blind samples. Measured event rate vs. applied voltage for the two prepared admixtures (see Fig. 4). Solid lines are linear fits to the data (i.e. values plotted in Fig. 4).