Sensing with nanopores - The influence of asymmetric blocking on electrochemical redox cycling current

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**Supporting Material 1**
Detailed parameter tables for all simulations.

- **Figure 2/3**
  - Number of active molecules: 1500
  - Spatial step width: 1 nm
  - Diffusion constant: $6.7 \times 10^{-9}$
  - Temporal step width: 0.75 ns
  - Number of iterations: $1.34 \times 10^8$
  - Simulated time interval: 0.1 s
  - Sum over iterations: $2.68 \times 10^5$
  - Sampling frequency: 5 kHz
  - Number of traces averaged: 10

- **Figure 5/6**
  - Number of active molecules: 1200
  - Spatial step width: 1 nm
  - Diffusion constant: $6.7 \times 10^{-9}$
  - Temporal step width: 0.75 ns
  - Number of iterations: $2.68 \times 10^8$
  - Simulated time interval: 0.2 s
  - Sum over iterations: $3.35 \times 10^4$
  - Sampling frequency: 40 kHz
  - Number of traces averaged: 50

**Supporting Material 2**
The absolute values of the current traces for both electrodes of an unblocked nanopore. The red curve shows the current occurring at the bottom electrode, the parameters are equal to the one used for the simulation of the current traces for figure 5/6. The blue curve shows the current for the top electrode. It can be seen, that within one millisecond the steady state is reached and both currents are in close agreement.
Supporting Material 3
The ratio of the absolute values of the fluctuation and shot noise plateaus simulated for blocking of a single spherical particle with a radius of 3 nm using pore diameters of 50 nm and 15 nm.
The parameters for the 50 nm pore are the same as mentioned in supporting material 1, 10 traces were averaged. For the 15 nm pore the following parameters were used:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of active molecules</td>
<td>1200</td>
</tr>
<tr>
<td>Spatial step width</td>
<td>0.5 nm</td>
</tr>
<tr>
<td>Diffusion constant</td>
<td>$6.7 \times 10^{-9}$</td>
</tr>
<tr>
<td>Temporal step width</td>
<td>0.19 ns</td>
</tr>
<tr>
<td>Number of iterations</td>
<td>$5.36 \times 10^8$</td>
</tr>
<tr>
<td>Simulated time interval</td>
<td>0.1 s</td>
</tr>
<tr>
<td>Sum over iterations</td>
<td>$3.35 \times 10^4$</td>
</tr>
<tr>
<td>Sampling frequency</td>
<td>160 kHz</td>
</tr>
<tr>
<td>Number of traces averaged</td>
<td>3</td>
</tr>
</tbody>
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