1 Specification of DNA nanopore

DNA pore: height 7.5 nm, outer diameter 5 nm, inner diameter 2 nm. Consists of 6 DNA strands. Not permeable for fluorophore, but permeable for ions. Centered in membrane.

Surface charge density of the DNA pore: -1 elementary charges per nm^2 (negatively charged).

Fluorophore which translocates pore: carries -3 and $+1$ charges, size approximately 1.1 nm.

Fluorophore which cannot translocate pore: -3 charges, size approximately 0.8 nm.

Ions: 0.3 M KCl. 10 mM buffer.

No applied voltage. The transport is driven only by the concentration gradient.

Cavity: 5 fL volume, cylindrical, diameter 710 nm$\pm$130 nm, depth 10 μm$\pm$ 0.5 μm. Contains initial concentration 10 μM of fluorophore, which diffuses through the pore to the other side.

Diffusion coefficient of fluorophore in water: $10^{-10}\,\mathrm{m}^2/\mathrm{s}$.

Important features: one type of molecule (fluorophore) translocates the pore, the other cannot. They differ by charge and size.