

Table 1 | The dynamic range of NPC-mediated transport

Substrate	Dwell time (ms)	Peak centre (nm)	Distribution	Condition	Reference
NTF2	5.8 ± 0.2	-30	Symmetrical	Permeabilized cells	10
NTF2-cargo	5.2 ± 0.2	ND	ND	Permeabilized cells	10
Transportin	7.2 ± 0.3	-2	Symmetrical	Permeabilized cells	10
Transportin-cargo	5.6 ± 0.2	ND	ND	Permeabilized cells	10
Importin- α -cargo (depleted of CAS and GTP)	28 ± 1	ND	ND	Permeabilized cells	50
2×GFP-NLS	10 ± 1	ND	ND	Permeabilized cells, glycerol	39
2×GFP-NLS (depleted of Ran and GTP)	45 ± 5	ND	ND	Permeabilized cells, glycerol	39
2×GFP-NLS (15 mM importin- β)	1.0 ± 0.1	ND	ND	Permeabilized cells, glycerol	44
2×GFP-NLS	7.8 ± 0.4	ND	ND	Living cells, microinjection	44
2×GFP-NLS (competition with dextran)	1.8 ± 0.1	ND	ND	Living cells, microinjection	44
Importin- α -cargo	7.6 ± 0.5	ND	ND	Permeabilized cells	50
Importin- α -cargo (depleted of Ran-GTP)	31 ± 6	ND	ND	Permeabilized cells	50
Ran	10.5 ± 0.8 to 24.8 ± 1.6	-9 ± 82 to -37 ± 82	Symmetrical	Permeabilized cells	36
eGFP	0.4 ± 0.1 to 0.9 ± 0.2	ND	ND	Permeabilized cells	36
BSA	6.2 ± 0.3	-13 ± 1	Symmetrical	Living cells, microinjection	19
Importin- α	7.5 ± 0.8	-6 ± 2	Symmetrical	Living cells, microinjection	19
Importin- β	6.6 ± 0.2*	-10 ± 2	Symmetrical	Living cells, microinjection	19
Importin- β (Δ N44)	11.8 ± 0.6*	-8 ± 1	Symmetrical	Living cells, microinjection	19
Transportin	4.6 ± 0.1*	5 ± 2	Symmetrical	Living cells, microinjection	19
Importin- β	5 ± 2.2	ND	ND	Living cells, microinjection	37
Quantum dots	2 s to 15 min, median 34 s	-5 \ddagger	Symmetrical	Permeabilized cells	49
Dys mRNA	500	ND	ND	Living cells, MS2 system	40
β -Actin mRNA	180 ± 10	-97 ± 17 to 71 ± 22	Bimodal	Living cells, MS2 system	11

The dwell times for different factors used to probe NPC transport are given. Errors are indicated as published. Where available, the centre of the binding-site distribution along the transport axis is reported, and the shape of that distribution indicated. The peak centre was measured relative to a POM121-fluorescent-marker fusion protein (either POM121-GFP or POM-tandem Tomato). Symmetrical refers to shapes that have one peak and roughly similar decays on both sides. Bimodal refers to β -actin mRNA, for which several binding sites have been found. Condition refers to the preparation of cells and buffer conditions, as discussed in the text. BSA, bovine serum albumin; CAS, recycling cofactor for importin- α ; Dys, dystrophin; eGFP, enhanced green fluorescent protein; GFP, green fluorescent protein; ND, not determined; 2×GFP-NLS is an artificial transport cargo molecule, made from a fusion of two GFP molecules that have an NLS. The MS2 system is a method of visualizing mRNA using a cassette of stem-loops that binds tightly to the MS2 coat protein fused to GFP³¹.

*A second component of ~5 to 15% with a significantly longer dwell time was found.

\ddagger No POM121 used; peak positions found ~20 nm into the central channel.

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