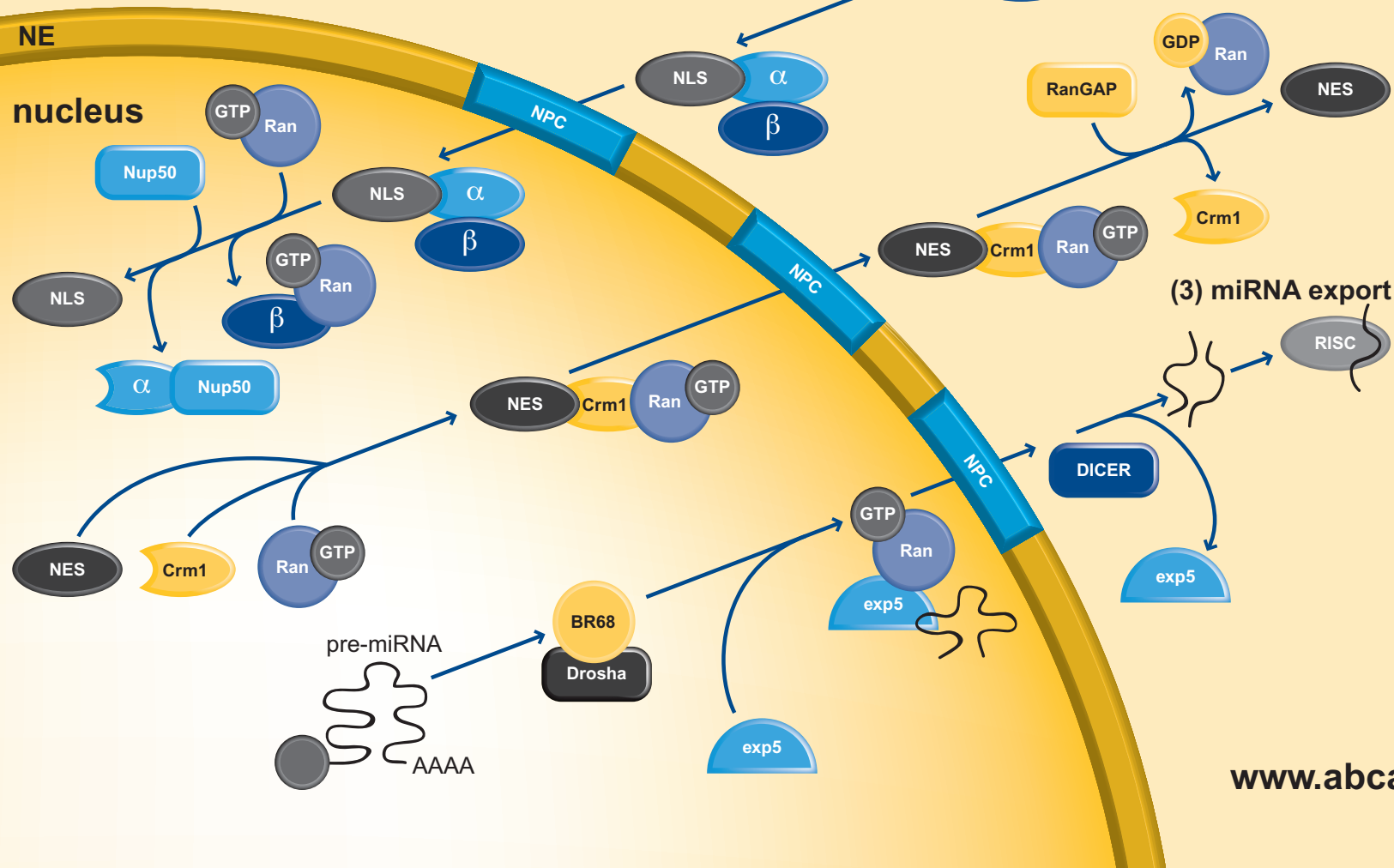


# Nucleocytoplasmic Transport Pathways

cytoplasm

(1) Nuclear import



Separation of transcription and translation is a hallmark of eukaryotic cells. The nuclear envelope (NE) is a physical barrier between the nucleus and cytoplasm. Nuclear pore complexes (NPC) provide a critical connection through the NE, enabling controlled bidirectional trafficking of molecules within the cell. The NPC allows passage of molecules up to 30-40 kilodaltons by passive diffusion. Translocation of larger molecules is dependent on specific transport receptors known as karyopherins. A Ran GTPase concentration gradient generates the energy required for transport. The NPC is composed of approximately 30 different proteins called nucleoporins (Nups). One class of Nups, containing FG (phenylalanine-glycine) repeats, line the NPC channel. These FG repeats act as a permeability barrier by providing docking sites for karyopherins. Importans and exportins are karyopherins that recognize nuclear localization signals (NLS) and nuclear export signals (NES) on proteins, respectively. These receptors serve to overcome the permeability barrier, easing passage of cargo molecules through the NPC core. General schemes of nuclear import (1) and export (2) are diagrammed.

Besides proteins, the passage of many types of RNA molecules between the nucleus and cytoplasm is also regulated by NPCs. One species of RNA gaining much interest is microRNA (miRNA). Following transcription and processing, pre-miRNA is exported to the cytoplasm via its receptor, exportin-5. After further processing, it is incorporated into the RNA-induced silencing complex (RISC), as diagrammed in (3).

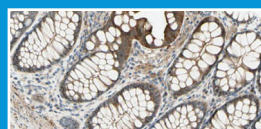


## Nuclear Signaling antibodies from Abcam:

See more products at: [www.abcam.com/nuclearsignal](http://www.abcam.com/nuclearsignal)

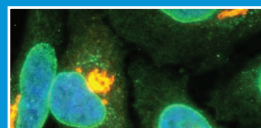
Product	Clonality	Applications	Host	Species Reactivity	Datasheet <a href="http://www.abcam.com/ab...">www.abcam.com/ab...</a>
Ago1	P	IHC-P, IP, WB	Rb	Hu, Dm	5070
Ago1	P	WB	Ms	S pom	43441
Ago2 / eIF2C2	P	IHC-P, WB	Rb	Hu	32381
Ago2 / eIF2C2	M	ICC/IF, IHC-P, WB	Ms	Hu	57113
CRM1	P	ICC/IF, WB	Rb	Hu, Ms, Rt	24189
Dcr 2 / Dicer 2	P	WB	Rb	Dm	4732
Dcr1 / Dicer 1	P	WB	Ms	Dm	52680
Dicer	P	ELISA, Flow Cyt	Rb	Hu	72532
Dicer [13D6] - ChIP Grade	M	ChIP, ICC, ICC/IF, IHC-P, WB	Ms	Hu, Ms, Rt	14601
Drosha	P	ICC/IF, WB	Rb	Hu	12286
Drosha	P	ELISA, WB	Gt	Hu	58589
Exportin 5	P	IHC-P, WB	Rb	Hu	31351
Exportin 5	M	WB	Ms	Hu	57491
Exportin T [Los1]	M	ICC/IF, WB	Ms	Hu, Ms, Rt, Cow	49933
Importin 4	P	WB	Rb	Hu	28387
Importin 7	P	WB	Gt	Hu	15840
Importin 8	P	ICC/IF, WB	Rb	Hu, Chmp, Mk	72109
Importin 9 [EP1353Y]	M	Flow Cyt, ICC/IF, IHC-P, IP, WB	Rb	Hu, Ms	52605
Karyopherin (importin) beta 3	M	IHC-P, WB	Ms	Hu	55390
mTOR	P	ICC, IHC-Fr, IP, WB	Rb	Hu, Rt	2732
NTF97/Importin beta	P	IP, WB	Rb	Hu, Ms, XI	36775
NTF97/Importin beta	P	ICC/IF, WB	Rb	Hu, Ms, Rt	45938
NTF97/Importin beta [3E9]	M	ICC/IF, Inhib, IP, WB	Ms	Hu, Ms, Rt, AGMk, Dog	2811
Nucleoporin p62	M	WB	Ms	Hu	56982

Product	Clonality	Applications	Host	Species Reactivity	Datasheet <a href="http://www.abcam.com/ab...">www.abcam.com/ab...</a>
Nup107	P	WB	Rb	Hu, Ms, Rt	73290
NUP133	M	IHC-P, WB	Ms	Hu	57645
Nup153 [QE5]	M	ICC, IF, IP, WB	Ms	Hu, Ms	24700
NUP160	P	WB	Rb	Hu, Ms, Rt	73293
NUP43	P	ICC/IF, WB	Ms	Hu	69447
NUP50	P	WB	Gt	Hu, Ms	4005
Nup53	P	WB	Rb	Hu, Ms, Rt	76381
NUP54	P	ELISA, WB	Rb	Hu	71315
NUP93 [3332C2a]	M	WB	Ms	Hu	53750
NUP98	P	WB	Rb	Hu	45584
NUP98 [2H10]	M	Dot, ELISA, ICC/IF, WB	Rt	Hu, Ms, Rt	50610
NUPL1	P	ICC/IF, WB	Ms	Hu	69954
Piwi	P	WB	Rb	Dm	5207
PIWIL2	P	WB	Rb	Ms	36764
PIWIL4	P	WB	Rb	Ms	21869
Ran	P	IHC-P, WB	Rb	Hu, Ms, Rt	31118
Ran [ARAN1]	M	ELISA, ICC, IP, WB	Ms	Hu, Ms, Cow, Hm, XI	13049
RanGAP1	P	ICC/IF, WB	Rb	Hu, Ms, XI	4784
RanGAP1 - Aminoterminal end	P	ICC/IF, WB	Rb	Hu	59565
RanGAP1 - Carboxyterminal end	P	ICC/IF, WB	Rb	Hu	53267
RNA Helicase A	P	ICC/IF, IHC-P, IP, WB	Rb	Hu, Ms, AGMk	26271
RNA Helicase A	M	IHC-P, WB	Ms	Hu	54593
TRBP	P	WB	Rb	Hu, Ms, Rt, Chmp, Cow, Zfish	72110
TRBP	P	IHC-P, WB	Rb	Hu, Hrs, Mk	72547



### Rabbit polyclonal to Piwi (ab12337)

**Clonality** P **Applications** IHC, WB **Host** Rb **Species cross reactivity** Hu, Ms, Rt  
Paraffin embedded human female colon incubated with ab12337 (1/200 dilution) for 30 mins at room temperature. Antigen retrieval was performed by heat induction in citrate buffer pH 6.



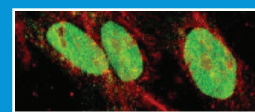
### Mouse monoclonal [QE5] to Nup153 (ab24700)

**Clonality** M **Applications** ICC/IF, IP, WB **Host** Ms **Species cross reactivity** Hu, Ms  
Methanol fixed HeLa stained with ab24700. This antibody brilliantly highlights the nuclear membrane (green). The golgi is stained with Giantin (yellow).



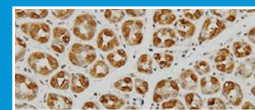
### Rabbit polyclonal to RNA Helicase A (ab26271)

**Clonality** P **Applications** ICC/IF, IHC-P, IP, WB **Host** Rb **Species cross reactivity** Hu, Ms, AGMk  
Paraffin embedded human stomach tissue was incubated with ab26271 (1/100 dilution) for 30 mins at room temperature. Antigen retrieval was performed by heat induction in citrate buffer pH 6.



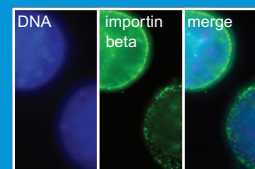
### mTOR antibody (ab2732)

**Clonality** P **Applications** ICC, IHC-Fr, IP, WB **Host** Rb **Species cross reactivity** Hu, Rat  
ab2732 at a 1:100 dilution confocally staining mTOR (red) in L6 myotubes, alongside a nuclear antigen antibody (green).



### Mouse monoclonal to Ago2 / eIF2C2 (ab57113)

**Clonality** M **Applications** ICC/IF, IHC-P, WB **Host** Ms **Species cross reactivity** Hu  
Ago2 / eIF2C2 antibody (ab57113) used at 3ug/ml on formalin fixed and paraffin embedded human stomach.



### Mouse monoclonal [3E9] to NTF97/Importin beta (ab2811)

**Clonality** M **Applications** ICC/IF, IP, Inhib, WB **Host** Ms **Species cross reactivity** Hu, Ms, Rt, AGMk, Dog  
NIH3T3 cells were incubated for 4 minutes in PHEM/1% Triton, washed for 2 minutes in 1x PHEM and fixed for 10 minutes at room temperature in 3.7% PFA containing 30mM sucrose. The cells were incubated for 2 minutes in 100% Methanol at -20°C, then washed 3 times in PBS. The cells were then incubated with ab2811 (1/200) for 1 hour at room temperature. The image panel shows the nuclei stained with DAPI (blue) and the nuclear envelope and cytoplasm stained with ab2811 (green). 100x magnification.