

Cell Nucleus: Import & Export through Nuclear Pores

Lecture 2

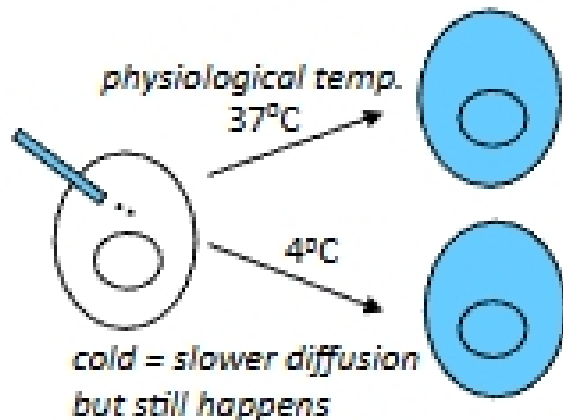
NUCLEAR IMPORT

- protein translation ONLY occurs in CYTOPLASM
- nearly all nuclear proteins must be imported from cytoplasm
- major substrate types:
 1. nuclear proteins: histones, chromatin scaffold proteins, pols.
 2. transcription factors
 3. snRNPs
 4. ribosomal subunit components
- after mitosis, NE re-forms & all nuclear proteins need ticket to get back into nucleus → never cut off signal on nuclear protein
 - compared to mitochondrial protein, whose signal gets cut off when it enters mitochondria

NUCLEAR IMPORT

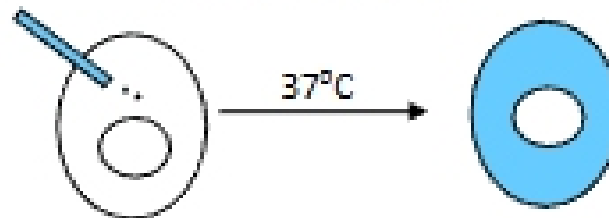
- small proteins enter nucleus via simple diffusion

- EX: lysozyme conjugated to fluorescein



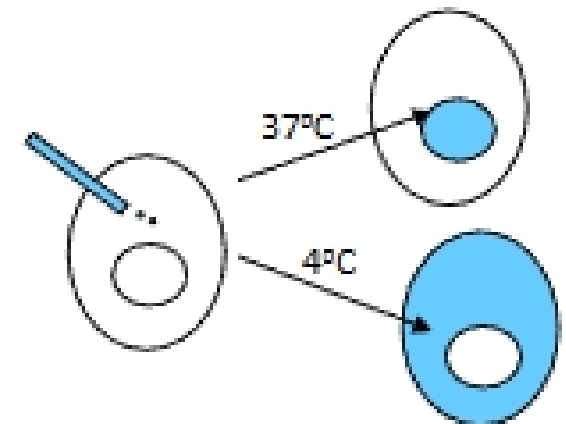
- large, non-nuclear proteins excluded from nucleus

- can't enter b/c don't have ticket (signal) to show receptor
- EX: bovine serum albumin conjugated to fluorescein



- large, nuclear proteins transported to nucleus via an active enzymatic process

- can't occur @ cold temp.
- EX: large T antigen of SV40 virus



small → simple diffusion; large, non-nuclear → excluded; large, nuclear → transported

Nuclear Import: Protein Types